User Manual

Allen-Bradley

5000 Series Digital I/O Modules in Logix5000 Control Systems

Catalog Numbers 5069-IB16, 5069-IB16F, 5069-IB6F-3W, 5069-OB16, 5069-OB16F, 5069-OW4I, 5069-OX4I

Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

	**WARNING:** Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
	**ATTENTION:** Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.

Labels may also be on or inside the equipment to provide specific precautions.

	**SHOCK HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.
	**BURN HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.
	**ARC FLASH HAZARD:** Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

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This manual describes how to use 5000 series digital I/O modules in Logix5000™ control systems.

Make sure that you are familiar with the following:

- Use of a controller in a Logix5000 control system
- Use of an EtherNet/IP network, if the digital I/O modules are installed in a remote location from the controller that is accessible via the | EtherNet/IP network
- Studio 5000 Logix Designer® environment

IMPORTANT Remember the following when you use 5000 series digital I/O modules:

- You cannot use 5000 Series modules with all Logix5000 controllers. For example, you can use the 5069 Compact I/O™ modules with ControlLogix® 5580 controllers but not with ControlLogix 5570 controllers.

  For more information on which Logix5000 controllers that you can use with 5000 series digital I/O modules, see the product description at http://www.ab.com.
- You must use the Logix Designer application, version 28 or greater, to configure the 5000 series digital I/O modules

Additional Resources

These resources contain information about related products from Rockwell Automation.

Table 1 - Additional Resources to Use with 5000 Series Digital I/O Modules

Resource	Description
5069 Compact I/O Digital 16-point Sinking Input Modules Installation Instructions, publication 5069-IN004	Describes how to install and wire the 5069-IB16 and 5069-IB16F digital input modules
5069 Compact I/O Digital 3-wire Sinking Input Module Installation Instructions, publication 5069-IN006	Describes how to install and wire the 5069-IB6F-3W digital input module
5069 Compact I/O Digital 16-point Sourcing Output Modules Installation Instructions, publication 5069-IN007	Describes how to install and wire the 5069-OB16 and 5069-OB16F digital output modules
5069 Compact I/O Digital 4-point Isolated Relay Output Module Installation Instructions, publication 5069-IN008	Describes how to install and wire the 5069-OW4I digital output module
5069 Compact I/O Digital 4-point Isolated Normally-open/Normally-closed Relay Output Module Installation Instructions, publication 5069-IN009	Describes how to install and wire the 5069-OX4I digital output module
5069 Compact I/O Field Potential Distributor Installation Instructions, publication 5069-IN001	Describes how to install and wire the 5069-FPD field potential distributor
5069 Compact I/O Address Reserve Module Installation Instructions, publication 5069-IN002	Describes how to install the 5069-ARM address reserve module
5069 Compact I/O EtherNet/IP Adapter Installation Instructions, publication 5069-IN003	Describes how to install and wire the 5069-AEN2TR EtherNet/IP adapter

Table 1 - Additional Resources to Use with 5000 Series Digital I/O Modules

5069 Compact I/O Modules Specifications Technical Data, publication 5069-TD001	Provides specifications, wiring diagrams and module block diagrams 5069 Compact I/O modules
5000 Series Analog I/O Modules in Logix5000 Control Systems User Manual, publication 5000-UM005	Provides information on how to install, configure, and operate 5000 Series analog I/O modules.
5000 Series High-speed Counter Modules in Logix5000 Control Systems User Manual, publication 5000-UM006	Provides information on how to install, configure, and operate 5000 Series high-speed counter modules.
EtherNet/IP Communication Modules in 5000 Series Control Systems User Manual, publication ENET-UM004	Provides information about the 5069-AEN2TR EtherNet/IP adapter and 5069 controller.
Integrated Architecture and CIP Sync Configuration Application Technique, publication IA-AT003	Provides information about CIP Sync technology and how to synchronize clocks within the Rockwell Automation® Integrated Architecture® system.
Electronic Keying in Logix5000 Control Systems Application Technique, publication LOGIX-AT001	Describes how to use electronic keying in Logix5000 control system applications.
Logix5000 Controllers Tasks, Programs, and Routines Programming Manual, publication 1756-PM005	Provides more information on event tasks and event task configuration.
Position-based Output Control with the MAOC Instruction, publication 1756-AT017	Describes how to configure time-scheduled output control with the MAOC instruction.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.rockwellautomation.com/rockwellautomation/certification/overview.page	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at http://literature.rockwellautomation.com/. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

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Logix5000™ controllers use the 5069 Compact I/O™ digital I/O modules to control devices in a control system. The controllers can access the modules over an EtherNet/IP network.

IMPORTANT You cannot use 5069 Compact I/O modules with all Logix5000 controllers. For example, you can use the 5069 Compact I/O modules with ControlLogix® 5580 controllers but not with ControlLogix 5570 controllers.

For more information on which Logix5000 controllers that you can use with 5069 Compact I/O modules, see the product description at http://www.ab.com.

This chapter describes 5069 Compact I/O digital I/O module operation when the modules are used with a ControlLogix® 1756-L85E controller.

5069 Compact I/O digital I/O modules use removable terminal blocks (RTBs) to connect field-side wiring. You use the Studio 5000 Logix Designer™ application to configure the modules.

5069 Compact I/O digital I/O modules use the Producer-Consumer network communication model. This communication is an intelligent data exchange between modules and other system devices in which each module produces data without first being polled.

Before You Begin

Before you use your digital I/O module, you must complete the following:

- Install an EtherNet/IP network
- Install a Logix5000 controller with a connection to the EtherNet/IP network.
- Install a 5069 Compact I/O system.

  For more information on how to install a 5069 Compact I/O system, see the 5069 Compact I/O EtherNet/IP Adapter Installation Instructions, publication 5069-IN003.
- Make sure that you have enough 5069 removable terminal blocks (RTBs) to satisfy your application needs.

IMPORTANT RTBs are not included with your module. You must purchase RTBs separately.

Types of Digital I/O Modules

Table 2 describes the types of 5069 Compact I/O digital I/O modules.

Table 2 - 5069 Compact I/O Digital I/O Modules

Cat. No.	Description
5069-IB16	10…32V DC 16-point, sink input module
5069-IB16F	10…32V DC 16-point, sink fast input module
5069-IB6F-3W	10…32V DC 6-point, 3 wire, sink fast input module
5069-OB16	10…32V DC 16-point, sourcing output module
5069-OB16F	10…32V DC 16-point, sourcing fast output module
5069-OW4I	5…264V AC /125V DC 4-point, isolated N.O. relay output module
5069-OX4I	5…264V AC /125V DC 4-point, isolated N.O/N.C. relay output module

Module Overview

Figure 1 shows the parts of an example 5069 Compact I/O digital I/O module.

Figure 1 - Example 5069 Compact I/O Digital I/O Module

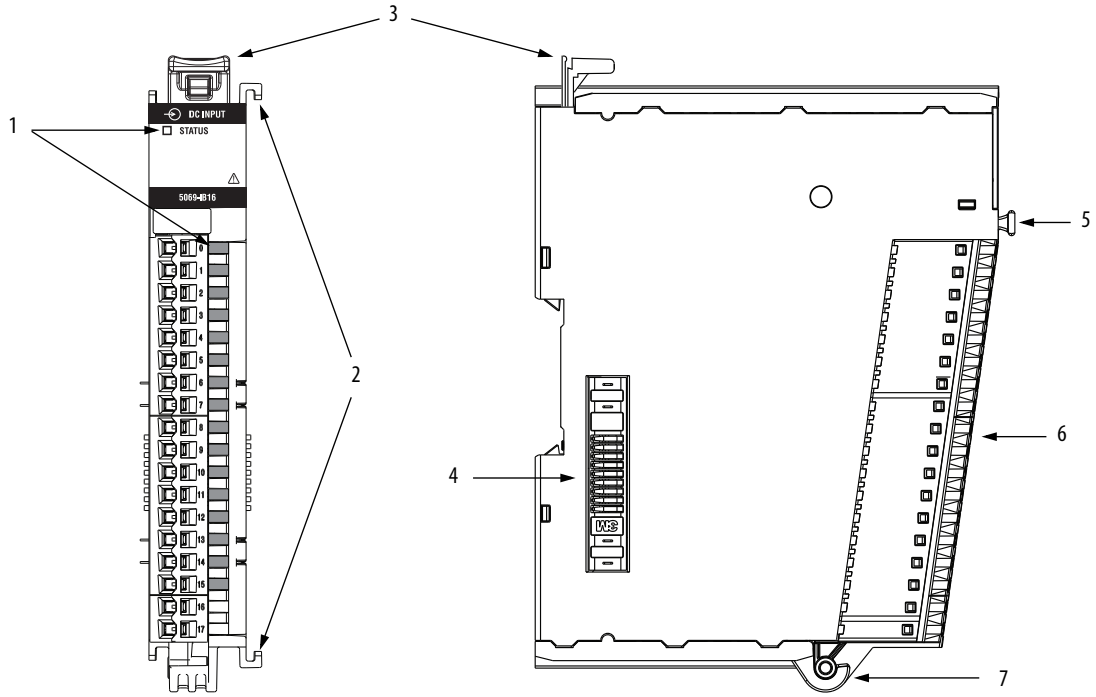


Table 3 - 5069 Compact I/O Digital I/O Module Parts

Item	Description
1	**Status indicators** - Displays the status of communication, module health, and input/output devices. Indicators assist in troubleshooting anomalies.
2	**Interlocking side pieces** - Securely installs 5069 Compact I/O modules in the system.
3	**DIN rail latch** - Secures the module on the DIN rail.
4	**MOD power bus and SA power bus connectors** - Pass system-side and field-side power across the internal circuitry of the I/O modules in a 5069 Compact I/O system. The connectors are isolated from each other.
5	**RTB handle** - Anchors the RTB on the module.
6	**RTB** - Provides a wiring interface for the module.
7	**RTB lower tab** - Hooks RTB onto the module to begin installation.

Ownership

Every I/O module in a Logix5000 control system must be owned by a controller, also known as the owner-controller. When the 5069 Compact I/O digital I/O modules are used in a Logix5000 control system, the **owner-controller** performs the following:

- Stores configuration data for every module that it owns.
- Can reside in a location that differs from the 5069 Compact I/O system.
- Sends the I/O module configuration data to define module behavior and begin operation in the control system.

Each 5069 Compact digital I/O module must continuously maintain communication with its owner-controller during normal operation.

Typically, each I/O module in a 5069 Compact I/O system has only one owner-controller. Output modules are limited to one owner-controller.

Multiple Owners of 5069 Compact I/O Input Modules

While typically only one owner-controller is connected it a 5069 Compact I/O digital input module, it is possible for more than one Logix5000 controller to connect to 5069 Compact I/O digital input modules as owner-controllers. In this case, the following conditions must exist:

- The controllers maintain the same configuration.
- The configuration in each controller uses a Data connection to the input module.
- The first controller to make a connection to the input module is the only controller that can change the connection. Therefore, it is 'owns' the module configuration.

IMPORTANT	If the controller that owns the module configuration changes the configuration, the other controllers lose their connection until they have the updated configuration.

- The controllers that do maintain, but do not 'own', the module configuration are similar to Listen-only controllers with the exception that they can use the Multicast or Unicast connection over the EtherNet/IP network.

  For more information on Listen-only controllers, see Listen Only Mode on page 20.

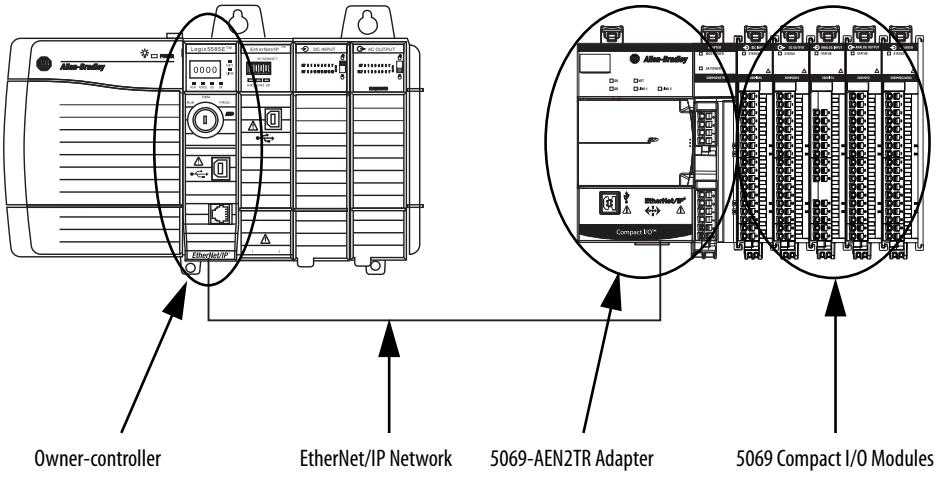
Construct a 5069 Compact I/O System

At minimum, a 5069 Compact I/O system must include a 5069-AEN2TR EtherNet/IP adapter. The system can contain other 5069 Compact I/O modules.

The example in Figure 2 shows the owner-controller in 1756 ControlLogix chassis that is connected to the 5069 Compact I/O modules via an EtherNet/IP network.

IMPORTANT As noted on page 9, 5069 Compact I/O modules are not compatible with all Logix5000 controllers.

Figure 2 - 5069 Compact I/O Modules in a Logix5000 Control System



5069 Compact I/O System Power

The 5069-AEN2TR EtherNet/IP adapter provides system-side and field-side power to a 5069 Compact I/O system.

- System-side power that powers the 5069 Compact I/O system and lets modules transfer data and execute logic.
- Field-side power that powers field-side devices that are connected to some 5069 Compact I/O modules.

For more information on how to power a 5069 Compact I/O system, see the EtherNet/IP Communication Modules in 5000 Series Systems User Manual, publication ENET-UM004

Configure a 5069 Compact I/O System

You must create a Logix Designer application project for the Logix5000 controller that owns the 5069 Compact I/O digital I/O module. The project includes module configuration data for the 5069 Compact I/O digital I/O modules.

The Logix Designer application transfers the project to the owner-controller during the program download. Data is then transferred to the 5069 Compact I/O digital I/O modules over the EtherNet/IP network.

The 5069 Compact I/O digital I/O modules can operate immediately after receiving the configuration data.

Connections

During module configuration, you must define the module. Among the Module Definition parameters, you must choose a connection type for the module. A connection is a real-time data transfer link between the owner-controller and the module that occupies the slot that the configuration references.

When you download module configuration to a controller, the controller attempts to establish a connection to each module in the configuration.

Because part of module configuration includes a slot in the 5069 Compact I/O system, the owner-controller checks for the presence of a module there. If a module is detected, the owner-controller sends the configuration. One of the following occurs:

- If the configuration is appropriate to the module detected, a connection is made and operation begins.
- If the configuration is not appropriate to the module detected, the data is rejected and the Logix Designer application indicates that an error occurred.

  The configuration can be inappropriate for many reasons. For example, a mismatch in electronic keying that prevents normal operation.

The owner-controller monitors its connection with a module. Any break in the connection, for example, the loss of power to the 5069 Compact I/O system, causes a fault. The Logix Designer application monitors the fault status tags to indicate when a fault occurs on a module.

Connection Types Available with 5069 Compact I/O Digital I/O Modules

When configuring a 5069 Compact I/O digital I/O module, you must define the module. Connection is a required parameter in the Module Definition. The choice determines what data is exchanged between the owner-controller and the module.

Table 4 describes the connection types that you can use with 5069 Compact I/O digital I/O modules.

Table 4 - Connections - 5069 Compact I/O Digital I/O Modules

Connection Type	Description	
	5069 Compact I/O Digital Input Modules	**5069 Compact I/O Digital Output Modules**
Data	The module returns the following to the owner-controller: • General fault data • Input data	The module returns the following to the owner-controller: • General fault data • Output data
Data with Events(1)	The module returns the following to the owner-controller: • Event fault data • Event input data • Event output data	N/A
Listen Only Data	When a Listen Only Data connection is used, another controller owns the module. A controller that makes a Listen Only Data connection to the module does not write configuration for the module. It merely listens to the data exchanged with the owner-controller. **IMPORTANT**: If a controller uses a Listen Only connection, the connection must use the Multicast option. For more information on Listen Only connections, see Listen Only Mode on page 20. In this case, all other connections to the module, for example, the connection to the owner-controller must also use the Multicast option.	

(1) Data with events is available on only the 5069-IB16F and 5069-IB6F-3W digital input modules.

Data Types Available with 5069 Compact I/O Digital I/O Modules

The Module Definition includes a Data parameter that matches the module type. Digital input modules use Input Data, and digital output modules use Output Data.

The module type and Connection choice determine the available Input Data or Output Data choices. For example, you can configure a 5069-IB16F digital input module to use the Connection choice Data with Events. The resulting Input Data choices are Data with Events include Data, Packed Data, or Timestamped Data.

The 5069-IB16 digital input module does not support the Connection choice Data with Events, however. As a result, the Input Data choice Timestamped Data is not available.

For more information on the Connection and Data parameter choices available with 5069 Compact I/O modules, see the Logix Designer application.

Requested Packet Interval

The Requested Packet Interval (RPI) is a configurable parameter that defines a specific rate at which data is exchanged between the owner-controller and the module.

You set the RPI value during initial module configuration and can adjust it as necessary after module operation has begun. Valid RPI values are 0.2...750 ms.

IMPORTANT If you change the RPI while the project is online, the connection to the module is closed and re-opened in one of the following ways:

- You inhibit the connection to the module, change the RPI value, and uninhibit the connection.
- You change the RPI value. In this case, the connection is closed and re-opened immediately after you apply the change to the module configuration.

For more information on guidelines for specifying RPI rates, see the Logix5000 Controllers Design Considerations Reference Manual, publication 1756-RM094.

Connection Over EtherNet/IP

During module configuration, you must configure the Connection over EtherNet/IP parameter. The configuration choice dictates how input data is broadcast over the network.

The 5069 Compact I/O digital I/O modules use one of the following methods to broadcast data:

- Multicast - Data is sent to all network devices
- Unicast - Data is sent to a specific controller depending on the module configuration

  Unicast is the default setting. We recommend that you use Unicast because it reduces network bandwidth usage.

Input Module Operation

Logix5000 controllers do not poll the 5069 Compact I/O digital input modules for input data. Instead, the modules broadcast their input data, that is, channel and status data, to the CompactBus at the time that is defined in the RPI.

At the RPI, the following events occur.

1. The 5069 Compact I/O digital input module scans its channels for input data.
2. The module sends the data to the 5069 Compact I/O system CompactBus.
3. The 5069-AEN2TR EtherNet/IP adapter in the 5069 I/O system sends the data over the EtherNet/IP network.
4. One of the following:
   - If the owner-controller is directly connected to the EtherNet/IP network, it receives the input data immediately.
   - If the owner-controller is connected to the EtherNet/IP network through another communication module, the module sends the data to its backplane and the controller receives it.

Trigger Events

Some 5069 Compact I/O digital input modules can trigger an events. For example, the modules can trigger the Event task. The event task lets you execute a section of logic immediately when an event, or receipt of new data, occurs.

The events can be triggered by a single discrete input state change, counting input done bit change, or a pattern of input state changes on multiple module inputs.

For more information on how to use a 5069 Compact I/O digital input module to trigger an event, see Events on page 41.

Output Module Operation

The controller sends data to an output module at the RPI or after an Immediate Output (IOT) instruction is executed.

The RPI defines when the controller sends data to the 5069 Compact I/O digital output module and when the output module echoes data. The controller sends data to an output module only at the RPI.

At the RPI, not only does the controller send data to the output module, but also the output module sends data to the controller. For example, the output module sends an indication of the channel data quality.

Controller to Output Module Data Transmission

The controller broadcasts data to its local backplane at one of the following:

- RPI
- An Immediate Output (IOT) instruction is executed.

IMPORTANT	An IOT instruction sends data to the output module immediately, and resets the RPI timer.

Based on the RPI rate and the length of the controller program scan, the output module can receive and echo data multiple times during one program scan.

When the RPI is less than the program scan length, the output channels can change values multiple times during a program scan. The owner-controller does not depend on the program scan to complete to send data.

These events occur when the controller sends data to a 5069 Compact I/O output module.

1. Data is sent in one of the following ways:
   - If the controller is directly connected to the EtherNet/IP network, it broadcasts data to the network.

     In this case, skip to step 3.

   - If the controller is connected to the EtherNet/IP network via a communication module, the controller transmits the data to the backplane.

     In this case, skip to step 2.

2. The EtherNet/IP communication module transmits the data to the EtherNet/IP network.
3. After receiving data from the network, the 5069-AEN2TR EtherNet/IP adapter in the 5069 Compact I/O system receives the data from the network and transmits it to the 5069 Compact I/O system backplane.
4. The 5069 Compact I/O digital output module receives the data from the backplane and behaves as dictated by its configuration.

Output Module to Controller Data Transmission

When an output module receives new data and the requested data value is present on the RTB, the output module sends, or 'echoes', a data value back to the controller and to the rest of the control system. The data value corresponds to the signal present at its terminals. This feature is called Data Echo.

In addition to the Data Echo, the output module sends other data to the controller at the RPI. For example, the module alerts the controller if a short circuit condition exists on the module.

The following events occur when a 5069 Compact I/O digital output module sends data to the controller at the RPI.

1. The module sends the data to the 5069 Compact I/O system backplane.
2. The 5069-AEN2TR EtherNet/IP adapter in the 5069 Compact I/O system sends the data over the EtherNet/IP network.
3. One of the following:
   - If the owner-controller is directly connected to the EtherNet/IP network, it receives the input data from the network without need for a communication module.
   - If the owner-controller is connected to the EtherNet/IP network through another communication module, the module transmits the data to its backplane and the controller receives it.

Listen Only Mode

Any controller in the system can listen to the data from an I/O module. An owner-controller, as described in Ownership on page 12, exchanges data with digital I/O modules.

Other controllers can use a Listen Only connection with the digital I/O module. In this case, the 'listening' controller can only listen to input data or 'echoed' output data. The listening controller does not own the module configuration or exchange other data with the module.

During the I/O configuration process, you can specify a Listen Only connection. For more information on Connection options, see Module Definition Parameters on page 65.

IMPORTANT Remember the following:

- If a controller uses a Listen Only connection, the connection must use the Multicast option. In this case, all other connections to the module, for example, the connection of the owner-controller, must also use the Multicast option.
- If a controller attempts to use a Listen Only connection to a module but the owner-controller connection uses the Unicast option, the attempt at a Listen Only connection fails.

  The 'Listen Only' controller receives data from the module as long as a connection between an owner-controller and module is maintained.
- If the connection between an owner-controller and the module is broken, the module stops sending data and connections to all 'listening controllers' are also broken.

5069-ARM and 5069-FPD Modules

The following 5069 modules are available for unique purposes in a 5069 Compact I/O system:

- 5069-ARM Address Reserve Module
- 5069-FPD Field Potential Distributor

5069-ARM Address Reserve Module

The 5069-ARM address reserve module reserves a node address in a 5069 Compact I/O system. The module remains installed until you insert another 5069 Compact I/O module into the same location.

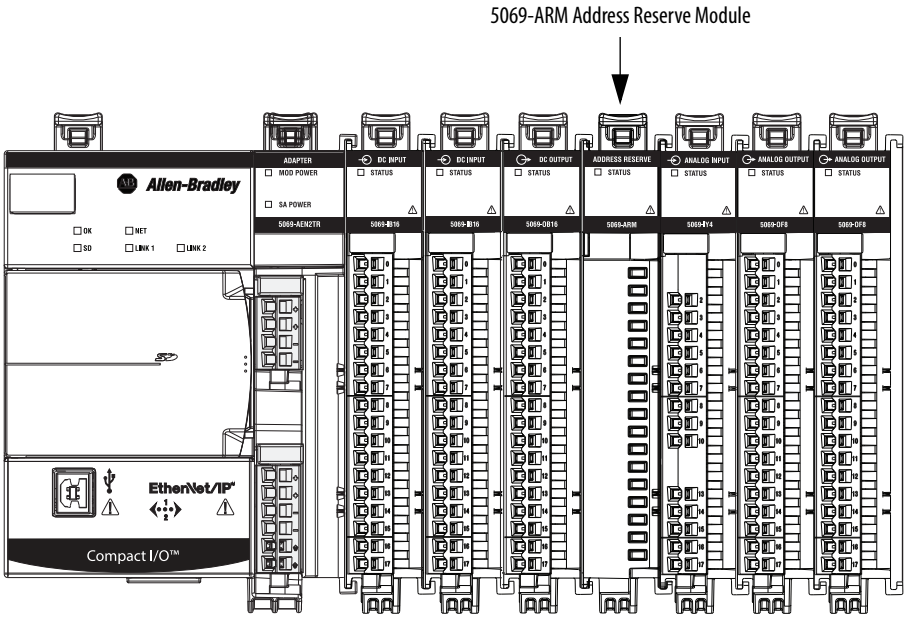
For example, your application can require the use of a 5069-IB16 module in a specific node location. The module is typically installed when you install the 5069 Compact I/O system. In this case, however, the required 5069-IB16 module is not available for insertion.

To install 5069 Compact I/O modules, you attach them to left-most device in the system. The node addresses increment as each module is installed. To make sure that the 5069-IB16 module is installed in the correct location later, you install a 5069-ARM address reserve module during initial system installation.

When the required 5069-IB16 module is available, you remove the 5069-ARM address reserve module and replace it with the 5069-IB16 module. Thus, you insert the module in the correct node address location.

Figure 3 shows a 5069 Compact I/O system that uses a 5069-ARM address reserve module to reserve a node address.

Figure 3 - 5069 Compact I/O System with 5069-ARM Address Reserve Module



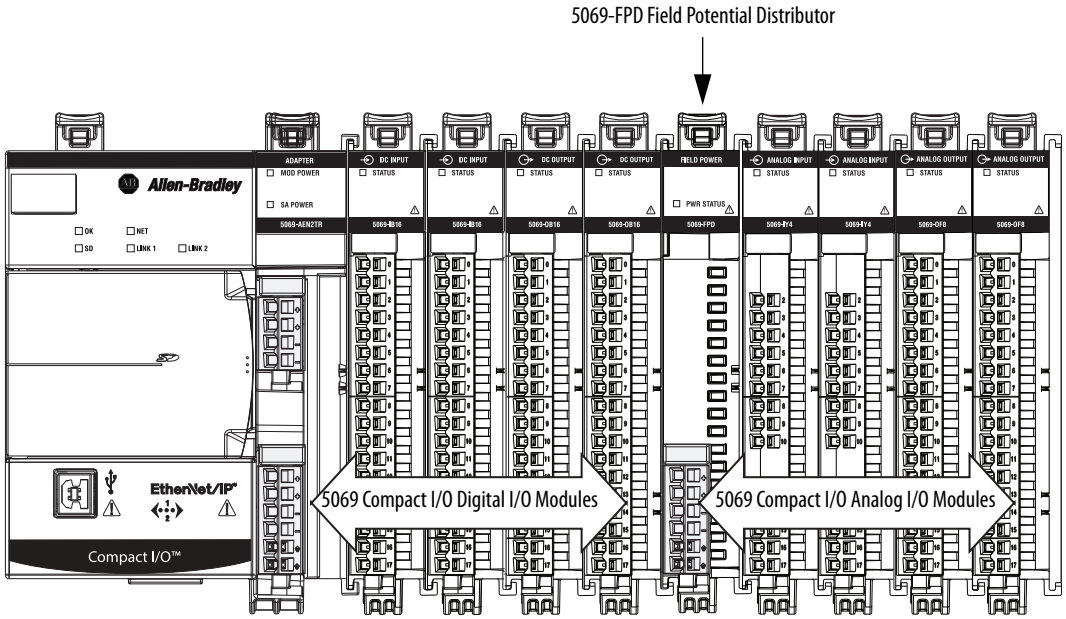
5069-FPD Field Potential Distributor

The 5069-AEN2TR EtherNet/IP adapter is the primary source of field-side power in the system. However, you can use a 5069-FPD field potential distributor to break field-side power distribution in a 5069 Compact I/O system.

Field-side power passes across the internal circuitry of the 5069 Compact I/O modules beginning with the adapter. The field potential distributor blocks the passage of field-side power to the left of the distributor and functions as a new field-side power source for the modules to the right.

Figure 4 shows a 5069 Compact I/O system that includes a field potential distributor. In this example, the field potential distributer is used to isolate digital I/O modules from analog I/O modules with respect to field-side power.

Figure 4 - 5069 Compact I/O System with 5069-FPD Field Potential Distributor



For more information on how to power a 5069 Compact I/O system, see the EtherNet/IP Communication Modules in 5000 Series Systems User Manual, publication ENET-UM004

Protected Operations

To ensure the secure operation of your 5069 Compact I/O digital I/O module, operations that can disrupt module operation are restricted based on the module operating mode. Table 5 describes the restrictions.

Table 5 - Protected Operations on 5069 Compact I/O Digital I/O Modules

Current Module Operation	Activity						
	Firmware Update Request	Module Reset Request	Connection Request	Configuration Change	Connection or Data Format Change	Electronic Keying Change	RPI Change
Connection not running	Accepted						
Connection running	Rejected		Accepted(1)	Accepted(2)	Not allowed(3)	Accepted(4)	
Firmware update is in process	Rejected						

(1) Only requests for Listen Only connections are accepted.

(2) Configuration change is accepted in the following scenarios:
- Changes are made in the Module Properties dialog box and you click Apply.
- Changes are made in the Configuration tags and you send a Reconfigure Module MSG to the module.

(3) The difference between Rejected and Not allowed is that rejected activities can be attempted in the Logix Designer application but do not take effect. The activities that are not allowed, that is, attempts to change the Connection or Data Format used, are prevented from occurring in the Logix Designer application.
For example, if you attempt to reset a module that is connected to the owner-controller, the Logix Designer application executes the request and alerts you that it was rejected. If you attempt to change the data format on a module that is connected to an owner-controller, the Logix Designer application does not execute the attempted change. The application only alerts you that the change is not allowed. In the case, if the change is attempted online, the Module Definition dialog box field that changes the data format is disabled.

(4) The change occurs after the connection is closed and reopened. You can close and reopen the connection in the following ways:
- Change the project while it is offline and download the updated project before going online again.
- Change the project while it is online and click Apply or OK in the Module Properties dialog box. In this case, before the change is made, a dialog box alerts you of the ramifications before the change is made.

Notes:

Common Digital I/O Module Features

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This chapter describes module features that are available on all 5069 Compact I/O™ digital I/O modules.

Input Module Compatibility

5069 Compact I/O digital input modules interface to sensing devices and detect whether they are On or Off.

5069 Compact I/O digital input modules convert DC On/Off signals from user devices to appropriate logic level for use within the processor. Typical input devices include the following:

- Proximity switches
- Limit switches
- Selector switches
- Float switches
- Push button switches

When you design systems with 5069 Compact I/O digital input modules, consider these factors:

- Voltage necessary for your application
- Current leakage
- Whether you need a solid-state device
- Whether your application uses sinking or sourcing wiring

Output Module Capability

5069 Compact I/O digital output modules can be used to drive various output devices. Typical output devices compatible with 5069 Compact I/O digital output modules include these items:

- Motor starters
- Solenoids
- Indicators

Follow these guidelines when designing a system:

- Make sure that the 5069 Compact I/O digital output modules can supply the necessary surge and continuous current for proper operation.
- Make sure that the surge and continuous current are not exceeded. Damage to the module could result.

When you size output loads, refer to the documentation supplied with the output device for the surge and continuous current necessary to operate the device.

The 5069 Compact I/O digital outputs can directly drive the 5069 Compact I/O digital inputs.

Module Data Quality Reporting

The 5069 Compact I/O digital I/O modules indicate the quality of channel data that is returned to the owner-controller. Data quality represents accuracy. Levels of data quality are reported via module input tags.

The following input tags indicate the level of data quality.

- **I.Pt*xx*.Fault** - This tag indicates that the reported channel data is **inaccurate** and **cannot be trusted** for use in your application. Do not use the reported channel data for control.

  If the tag is set to 1, you cannot trust the data reported. You must troubleshoot the module to correct the cause of the inaccuracy.

  The typical causes of inaccurate data include the following:
  - Wire Off (input modules) or No Load (output modules) condition
  - Underrange/Overrange condition
  - Short Circuit condition

  We recommend that you troubleshoot the module for the typical causes first.

- **I.Pt*xx*.Uncertain** - This tag indicates that the reported channel data can be **inaccurate** but the **degree of inaccuracy is unknown**. We recommend that you do not use the reported channel data for control.

  If the module sets this tag to 1, you know that the data can be inaccurate. You must troubleshoot the module to discover what degree of inaccuracy exists.

  The typical causes of uncertain data include the following:
  - Data signal slightly outside the channel operating range
  - Invalid sensor offset value
  - The last point data sample failed CRC while the most recent data sample was valid and used

  We recommend that you troubleshoot the module for the typical causes first.

We recommend that you monitor these tags in your program to make sure that the application is operating as expected with accurate channel input data.

IMPORTANT Once the condition that causes the Fault or Uncertain tag to change to 1 is removed, the tag automatically resets to 0. The Logix Designer application controllers these tags. You cannot change the status of the tags.

Keep in mind that in some system configurations, the tag is not reset immediately after the condition is removed. The tag typically resets after a small delay.

Software Configurable

You use the Logix Designer application to configure the module, monitor system operation and troubleshoot issues. You can also use the Logix Designer application to retrieve the following information from any module in the system:

- Serial number
- Firmware revision information
- Product code
- Vendor
- Error and fault information
- Diagnostic information

By minimizing the need for tasks, such as setting hardware switches and jumpers, the software makes module configuration easier and more reliable.

Fault and Status Reporting

The 5069 Compact I/O digital I/O modules report fault and status data along with channel data. Fault and status data is reported in the following ways:

- Logix Designer application
- Module status indicators

For more information on fault reporting, see the individual module feature chapters and Appendix A, Troubleshoot Your Module on page 87.

Module Inhibiting

Module inhibiting lets you indefinitely suspend a connection, including Listen Only connections, between an owner-controller and a digital I/O module without removing the module from the configuration. This process lets you temporarily disable a module, such as to perform maintenance.

You can use module inhibiting in the following ways:

- You write a configuration for an I/O module but inhibit the module to prevent it from communicating with the owner-controller. The owner does not establish a connection and the configuration is not sent to the module until the connection is uninhibited.
- In your application, a controller already owns a module, has downloaded the configuration to the module, and is exchanging data over the connection between the devices.

In this case, you can inhibit the module and the connection to the module does not exist.

IMPORTANT	Whenever you inhibit an output module that is ProgMode enabled, it enters Program mode, and all outputs change to the state configured for Program mode. For example, if an output module is configured so that the state of the outputs transition to zero during Program mode, whenever that module is inhibited, outputs transition to zero.

You can use module inhibiting in these instances:

- You want to update a digital I/O module, for example, update the module firmware revision. Use the following procedure.
  a. Inhibit the module.
  b. Perform the update.
  c. Uninhibit the module.
- You use a program that includes a module that you do not physically possess yet. You do not want the controller to look for a module that does not yet exist. In this case, you can inhibit the module in your program until it physically resides in the proper slot.

To see how to inhibit a 5069 Compact I/O digital I/O module, see page 66.

Electronic Keying

Electronic Keying reduces the possibility that you use the wrong device in a control system. It compares the device that is defined in your project to the installed device. If keying fails, a fault occurs. These attributes are compared.

Attribute	Description
Vendor	The device manufacturer.
Device Type	The general type of the product, for example, digital I/O module.
Product Code	The specific type of the product. The Product Code maps to a catalog number.
Major Revision	A number that represents the functional capabilities of a device.
Minor Revision	A number that represents behavior changes in the device.

The following Electronic Keying options are available.

Keying Option	Description
Compatible Module	Lets the installed device accept the key of the device that is defined in the project when the installed device can emulate the defined device. With Compatible Module, you can typically replace a device with another device that has the following characteristics: • Same catalog number • Same or higher Major Revision • Minor Revision as follows: – If the Major Revision is the same, the Minor Revision must be the same or higher. – If the Major Revision is higher, the Minor Revision can be any number.
Disable Keying	Indicates that the keying attributes are not considered when attempting to communicate with a device. With Disable Keying, communication can occur with a device other than the type specified in the project. **ATTENTION**: Be extremely cautious when using Disable Keying; if used incorrectly, this option can lead to personal injury or death, property damage, or economic loss. We **strongly recommend** that you **do not use** Disable Keying. If you use Disable Keying, you must take full responsibility for understanding whether the device being used can fulfill the functional requirements of the application.
Exact Match	Indicates that all keying attributes must match to establish communication. If any attribute does not match precisely, communication with the device does not occur.

Carefully consider the implications of each keying option when selecting one.

IMPORTANT Changing Electronic Keying parameters online interrupts connections to the device and any devices that are connected through the device. Connections from other controllers can also be broken.

If an I/O connection to a device is interrupted, the result can be a loss of data.

More Information

For more detailed information on Electronic Keying, see Electronic Keying in Logix5000 Control Systems Application Technique, publication LOGIX-AT001.

Producer/Consumer Communication

5069 Compact I/O digital I/O modules use the Producer-Consumer communication model to produce data without a controller polling them first. The modules produce the data and controllers consume it. That is, the owner-controller and controllers with a Listen Only connection to the module can consume it.

When an input module produces data, the controllers can consume the data simultaneously. Simultaneous data consumption eliminates the need for one controller to send the data to other controllers.

Status Indicators

Each 5069 Compact I/O digital I/O module has a status indicator on the front of the module that lets you check the health and operational status of a module. The status indicator displays vary for each module.

For more information on status indicators, see Appendix A, Troubleshoot Your Module on page 87.

Use Coordinated System Time with I/O Modules

This section describes how to use CST timestamps between standard I/O modules and the CIP Sync timestamps in fast I/O modules. Time masters generate a 64-bit coordinated system time (CST) for their respective chassis.

You can configure your digital input modules to access the CST and timestamp input data with a relative time reference of when that input data changes state.

IMPORTANT Because only one CST value is returned to the controller when any input point changes state, we recommend that you use timestamping on only one input point per module.

Table 6 describes how you can use CST timestamps.

Table 6 - CST Timestamp Options

Topic	Description
Timestamping for a sequence of events	You can use the CST to establish a sequence of events occurring at a particular input module point by timestamping the input data. To determine a sequence of events, you must complete the following: • Set the format of the input module to CST Timestamped Input Data. • Enable COS for the input where a sequence occurs, and disable COS for all other points on the module. **TIP** If you configure multiple inputs for COS, your module generates a unique CST each time any of those inputs change state if the changes do not occur within 500 µs of each other. If multiple inputs that are configured for COS change state within 500 µs of each other, one CST value is generated for all state changes. As a result, it appears as if they changed at the same time.
Timestamping with scheduled outputs	You can use timestamping with the scheduled outputs feature, so that after input data changes state and a timestamp occurs, an output point actuates at a specific time. You can schedule outputs into the future. Outputs sent in one packet can differ by approximately 2 seconds. Sending in multiple messages allows greater spacing between schedules. When you use timestamping of inputs and scheduled outputs, you must complete the following: • Choose a connection format for each input and output module that enables timestamping. • Use a 5069-AEN2TR EtherNet/IP communication device to provide consistent time to modules in the same rack. • Disable COS for all input points on the input module except the point being timestamped. **TIP** For scheduled outputs to work most effectively, remember the following: • The schedule fires when it is configured to. You must make sure that there is enough time for the schedule to plan ahead. If you are using an MAOC instruction, you cannot control the schedule. • A system-level grandmaster synchronizes the times of the I/O modules.

Use CIP Sync Time with Fast I/O Modules

The 5069-IB16F, 5069-IB6F-3W, and 5069-OB16F modules use CIP Sync for both timestamps and scheduling.

CIP Sync is a CIP implementation of the IEEE 1588 PTP (Precision Time Protocol). CIP Sync provides accurate real-time (Real-World Time) or Universal Coordinated Time (UTC) synchronization of controllers and devices that are connected over CIP networks. This technology supports highly distributed applications that require timestamping, sequence of events recording, distributed motion control, and increased control coordination.

The 5069-IB16F, 5069-IB6F-3W, and 5069-OB16F modules are CIP Sync slave-only devices. There must be another module on the network that functions as a master clock. For more information on how to use CIP Sync technology, see the Integrated Architecture® and CIP Sync Configuration Application Technique, publication IA-AT003.

Fast I/O modules can be used to capture timestamps and schedule outputs like CST-based modules while providing the following advantages:

- Fast I/O modules have much higher precision than CST-based modules.
- Inputs are timestamped by point, so multiple inputs can be configured for COS without losing timestamp data.
- CIP Sync is system-wide, so timestamp and schedule values are consistent across all modules in the system.

  For example, if you use timestamps on a 5069-IB16F module to schedule outputs on a 5069-OB16F module, the controller, input module, and output module are not required to reside in the same chassis as is the case with CST-based I/O.
- Output modules use all 64 bits of the timestamp to schedule, so there are no limits on schedule ranges.

Mixing CST and CIP Sync Modules in a 5000 Series System

CST is automatically enabled for each chassis that has been configured to use CIP Sync. Therefore, you can include modules that use CST for their time base into systems that have been configured to use CIP Sync. Also, there is a direct correlation between CIP Sync system time and the local chassis CST time.

The CIP Sync system time and local chassis CST time are related by this equation:

CIP Sync system time = CST time + offset

The offset in the preceding equation is a value unique to each chassis and can be obtained by using one of these methods:

- CSTOffset from the Wall Clock Time (WCT) object of a controller in the chassis
- SystemOffset from the Time Synchronize object of a controller in the chassis
- LocalClockOffset returned in an I/O connection from a CIP Sync capable module in the chassis

The previously described relationship enables CST and CIP Sync-based I/O to interoperate as long as the offset in the chassis that contains the CST-based module is accessible.

5069 Compact I/O digital I/O modules require Time Synchronization with any devices, such as the controller and any intervening modules, in the path. The Download warning dialog box message accounts for cases where only the following are affected:

- Integrated Motion
- 5069 Compact I/O digital I/O modules
- Integrated Motion and 5069 Compact I/O digital I/O modules

You can enable Time Synchronization directly from the Download confirmation dialog box.

Timestamping

The control system uses a 64-bit system clock. The modules support CIP Sync timestamping by using the 1588 protocol that is passed throughout the system. The 1588 protocol is defined in the IEEE 1588-2002 standard, publication Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems.

Each input channel scan or new output application is stamped with a CIP Sync timestamp. One timestamp is returned to the controller for the module with the input data transfer.

You can use this feature for the following:

- To identify the sequence of events in fault conditions or during normal operation.

  You can use the system clock between multiple modules in the same chassis or throughout a system in which a common Time Master is used.

- To measure the change between samples and detect when a new sample is available for processing via the logic. The change between sample likely correlates closely with the RPI if no samples are missed in the logic.

You can also use the 1588 Protocol to synchronize sampling for modules across the entire system. By using the Synchronized Sampling feature, you can configure multiple modules to coordinate their input samples precisely with each other by using the same RPI.

Synchronized Sampling lets you configure a test stand, for example, and take many measurements simultaneously across many modules, if needed, while still precisely coordinating the sampling. With these modules, the synchronized sampling coordinates within approximately ± 10 μs.

Use the System Clock to Timestamp Inputs and Schedule Outputs

This section describes how to use CST timestamps in standard and diagnostic I/O modules and the CIP Sync timestamps in fast I/O modules.

Use Coordinated System Time with Standard and Diagnostic I/O Modules

Time masters generate a 64-bit coordinated system time (CST) for their respective chassis.

You can configure your digital input modules to access the CST and timestamp input data with a relative time reference of when that input data changes state.

IMPORTANT Because only one CST value is returned to the controller when any input point changes state, we recommend that you use timestamping on only one input point per module.

Table 7 describes how you can use CST timestamps.

Table 7 - CST Timestamp Options

Topic	Description
Timestamping for a sequence of events	You can use the CST to establish a sequence of events occurring at a particular input module point by timestamping the input data. To determine a sequence of events, you must complete the following: • Set the format of the input module to CST Timestamped Input Data. • Enable COS for the input where a sequence occurs, and disable COS for all other points on the module.
	TIP If you configure multiple inputs for COS, your module generates a unique CST each time any of those inputs change state if the changes do not occur within 500 µs of each other. If multiple inputs that are configured for COS change state within 500 µs of each other, one CST value is generated for all state changes. As a result, it appears as if they changed at the same time.
Timestamping with scheduled outputs	You can use timestamping with the scheduled outputs feature, so that after input data changes state and a timestamp occurs, an output point actuates at a specific time. You can schedule outputs into the future. Outputs sent in one packet can differ by approximately 2 seconds. Sending in multiple messages allows greater spacing between schedules. When you use timestamping of inputs and scheduled outputs, you must complete the following: • Choose a connection format for each input and output module that enables timestamping. • Use a 5069-AEN2TR EtherNet/IP communication device to provide consistent time to modules in the same rack. • Disable COS for all input points on the input module except the point being timestamped.
	TIP For scheduled outputs to work most effectively, remember the following: • The schedule fires when it is configured to. You must make sure that there is enough time for the schedule to plan ahead. If you are using an MAOC instruction, you cannot control the schedule. • A system-level grandmaster synchronizes the times of the I/O modules.

Module Firmware

The 5069 Compact I/O digital I/O modules are manufactured with module firmware installed. If updated module firmware revisions are available in the future, you can update the firmware.

Updated firmware revisions are made available for a variety of reasons, for example, to correct an anomaly that existed in previous module firmware revisions.

You access updated firmware files at the Rockwell Automation® Product Compatibility and Download Center (PCDC). A link to the PCDC is available at http://www.ab.com,

At the PCDC, you can use the module catalog number to check for firmware updates. If the catalog number is not available then no updates exist at that time.

Digital Input Module Features

Topic	Page
Module Features	37
Fault and Status Reporting	46

Module Features

The following features are specific to 5069 Compact I/O™ digital input modules.

- Data Transfer at RPI or Change of State
- Software Configurable Filter Times
- Multiple Input Point Densities
- Module Health Diagnostic
- Simple Count Mode - 5069-IB16 and 5069-IB16F modules only
- Sequence of Events Per Point Timestamping - 5069-IB16F and 5069-IB6F-3W modules only
- Events - 5069-IB16F and 5069-IB6F-3W modules only
- Pulse Latching - 5069-IB16F and 5069-IB6F-3W modules only

Data Transfer at RPI or Change of State

Digital input modules always send data at the RPI, but they send data at a change of state only if the COS feature is enabled.

The table describes the two ways a module sends data to the owner-controller.

Method	Description
RPI	A user-defined rate at which the module updates the information sent to its owner-controller.
COS	Configurable feature that, when enabled, instructs the module to update its owner-controller with new data whenever a specified input point transitions from On to Off and Off to On. The data is sent at the RPI rate when there is no change of state. By default, this setting is always enabled for input modules.

To see where to set the RPI, see page 66.

Software Configurable Filter Times

You can adjust On to Off and Off to On filter times through Logix Designer application for all 5069 Compact I/O digital input modules. These filters improve noise immunity within a signal. A larger filter value affects the length of delay times for signals from these modules. The filter values are adjustable via intervals from 0 µs...50 ms in the Points category of the Module Properties window.

IMPORTANT Input filters on the 5069-IB16F and 5069-IB6F-3W modules function differently than the 5069-IB16 module.

To see where to set the RPI, see the following:

- 5069-IB16 module - page 68
- 5069-IB16F module - page 70
- 5069-IB6F-3W module - page 76

Multiple Input Point Densities

5069 Compact I/O digital input modules use either 6-point or 16-point densities for greater flexibility in your application. A point is the termination where a wire attaches to the input module from a field device. The module receives information from the device to this designated point, thus signaling when activity occurs.

Module Health Diagnostic

Each digital input module has a status indicator on the front of the module that indicates module health. For more information on status indicators, see Appendix A, Troubleshoot Your Module on page 87.

Simple Count Mode

Simple count mode is used to count input pulses. When using the simple counter function, the module counts input pulses up to the following frequencies:

- The simple counter maximum frequency for the 5069-IB16 module is: 500 Hz (inv. period 2 ms).
- The simple counter maximum frequency for the 5069-IB16F and 5069-IB6F-3W modules is: 30 kHz (inv. period 33.3 μs).

The modules compare total count to previously-programmed values and then can activate an associated output. The modules provide for count up functionality and counter overflow.

Sequence of Events Per Point Timestamping

Timestamping registers a time reference to a change in input data. The CST is used for timestamping.

IMPORTANT This feature is available only on the 5069-IB16F and 5069-IB6F-3W modules.

The 5069-IB16F and 5069-IB6F-3W DC input modules offer submillisecond timestamping on a per point basis. Timestamp values have ±10 μs accuracy and ±1 ns resolution.

You can use the CST to establish a sequence of events occurring at an input module point by timestamping the input data. To determine a sequence of events, you must perform the following:

- Set the Input Data parameter to Timestamp Data.
- Enable COS for the input point where a sequence occurs, and disable COS for all other points on the module.

To see where to set the Timestamping options, see the following:

- 5069-IB16F module - page 71
- 5069-IB6F-3W module - page 77

Events

You can use the Events feature to trigger events. The 5069-IB16F and 5069-IB6F-3W digital input modules support up to four event configurations.

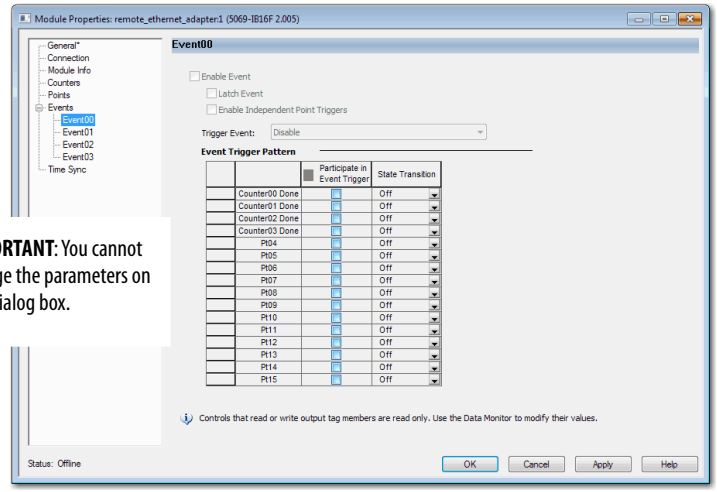
IMPORTANT This feature is available only on the 5069-IB16F and 5069-IB6F-3W modules.

The events can be triggered by a single discrete input state change, counting input done bit change, or a pattern of input state changes on multiple module inputs. You must use the **Data with Events** connection type in the Module Definition to use the Events feature.

Event Definition

You define an event. When you define an event, remember the following:

- The event definition parameters are shown on Events*xx* category in the Module Properties dialog box. The parameters are **read-only** in the dialog box as shown in the following example.



IMPORTANT: You cannot change the parameters on this dialog box.

- The event definition parameters are configured in the Event Output tags as shown in the following example.

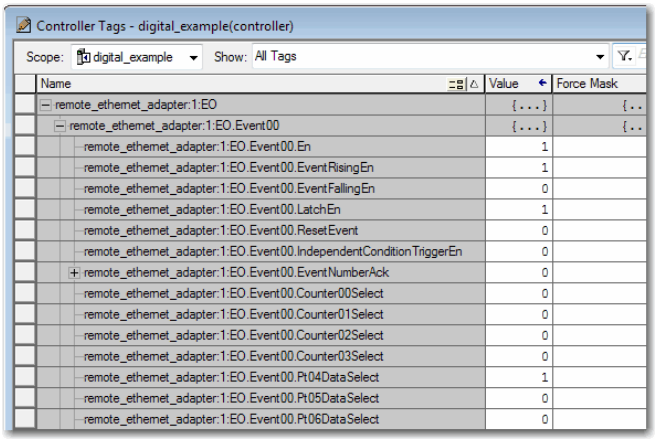


Table 8 describes the tasks that are included in defining an event.

Table 8 - Event Definition

Task	Event Output Tag to Change	Valid Values
Enable the event.	EO.Event*xx*.En	• 0 = Event is disabled • 1 = Event is enabled
Choose if a single input state change or a pattern of input state changes triggers the event.	EO.Event*xx*.IndependentConditionTriggerEn	• 0 = Pattern of input state changes triggers the event • 1 = Single input state change triggers the event
Select at least one point on the module to participate in the event.	The tag name changes based on the input function. The following names are available: • **EO.Event*xx*.PtxxDataSelect** - This tag appears for any point on the module if no counters are used. • **EO.Event*xx*.Counter*xx*Select** - These tags begin at point00 and continue based on the number of counters that the module uses.	• 0 = Point does not participate in the event trigger • 1 = Point participates in the event trigger
For all points that participate in the event, choose what constitutes an event state.	The tag name changes based on the input function. The following names are available: • **EO.Event*xx*.PtxxDataValue** - This tag appears for any point on the module if no counters are used. • **EO.Event*xx*.Counter*xx*Value** - These tags begin at point00 and continue based on the number of counters that the module uses.	• 0 = On to Off state transition • 1 = Off to On state transition
Choose which edge of the event triggers the event. That is, if the rising edge, falling edge, or either edge of the event.	Both of the following: • EO.Event*xx*.EventRisingEn • EO.Event*xx*.EventFallingEn	The combination of the tag settings determines which edge triggers the event: • Rising edge triggers the event set by the following combination: – EO.Event*xx*.EventRisingEn = 1 – EO.Event*xx*.EventFallingEn = 0 • Falling edge triggers the event set by the following combination: – EO.Event*xx*.EventRisingEn = 0 – EO.Event*xx*.EventFallingEn = 1 • Falling edge triggers the event set by the following combination: – EO.Event*xx*.EventRisingEn = 1 – EO.Event*xx*.EventFallingEn = 1
Latch the event. This task is optional.	EO.Event*xx*.LatchEn	• 0 = Event is not latched • 1 = Event is latched

Independent Point Trigger

A single input state change triggering an event is known as an independent point trigger.

To use this type of trigger, you must enable the Independent Point Trigger option in the event definition. You set the EO.Event*xx*.IndependentConditionTriggerEn tag to 1.

Pattern Match Trigger

When a pattern of input state changes triggers an event, multiple points participate in the event trigger. To use this type of trigger, you must disable the Independent Point Trigger option in the event definition. You set the EO.Event*xx*.IndependentConditionTriggerEn tag to 0.

Every point that participates in an event trigger is configured separately. Depending on the event definition, the collective status of all points triggers the event. The possible event triggers are as follows:

- **Enter pattern match state** - If the event is defined to trigger on the rising edge, the event is triggered when a state change on any participating point results in all point configuration conditions being met.

  In the event definition dialog box, Trigger Event = On input transition to match pattern.

- **Leave pattern match state** - If the event is defined to trigger on the falling edge, the event is triggered when a state change on any participating point results in all point configuration conditions no longer being met.

  In the event definition dialog box, Trigger Event = On input transition to not match pattern.

- **Enter or leave pattern match state** - If the event is defined to trigger on the rising or falling edge, the event is triggered when a state change on any participating point results in all point configuration conditions being met or no longer being met.

  In the event definition dialog box, Trigger Event = On input transition to not match pattern.

Additional Event Considerations

When you use the Events feature, also consider the following:

- An Event task only actuates if an event occurs.

IMPORTANT	Make sure that you link the Event task to the Event Input tag, not the Input tag.

- An event is recognized only when it maintains the same state for at least the duration of the input filter time specified.
- Configure the event at a rate that stops task overlap conditions. If you enable COS for multiple points, a task overlap of the event can occur.
- Configure the event at a rate that is likely to succeed. A 2 ms signal width is the minimum pulse width that can be used at which the event succeeds.
- After the event executes, it does not execute again until the event occurs again.
- For more information on event tasks, see the Logix5000 Controllers Tasks, Programs, and Routines Programming Manual, publication 1756-PM005.

To see where to configure the Events feature, see the following:

- 5069-IB16F module - page 73
- 5069-IB6F-3W module - page 79

Pulse Latching

You can use Pulse Latching to detect or latch short duration pulses. The module can detect incoming pulses with a duration as short as 10 µs if the frequency is under 4 kHz (period of 250 µs).

IMPORTANT This feature is available only on the 5069-IB16F and 5069-IB6F-3W modules.

When the module detects a short duration pulse at an input point, it sets the corresponding bit for the Pt[*x*].NewDataOffOn or Pt[*x*].NewDataOnOff input tag. This bit remains latched until acknowledged. This bit can be used to detect a transition that is too fast for the program scan to detect. You can also determine how rapid the transition was by configuring the module to latch timestamps for the point.

To acknowledge the last captured pulse and reset the pulse latch, you set the rising edge of the corresponding bit in these output tags:

- Pt[*x*].NewDataOffOnAck—Acknowledges that the input point has transitioned to an On state and resets the pulse latch.
- Pt[*x*].NewDataOnOffAck—Acknowledges that the input point has transitioned to an Off state and resets the pulse latch.

Once a pulse latch is reset for an input point, the next pulse at that point sets the corresponding bit in the Pt[x].NewDataOffOn or Pt[x].NewDataOnOff input tags.

You can change output tag values in program logic while normal module operation continues or through the Logix Designer application tag editor. For more information about module tags, see Appendix B, Module Tag Definitions on page 97.

Fault and Status Reporting

The digital input modules multicast fault and status data with channel data to the owner and listening controllers. The data is returned via module tags that you can monitor in your Logix Designer application.

With some exceptions, the 5069 Compact I/O digital input modules provide the fault and data status in a point-centric format. The tag names in the following table that include Ptxx represent point-centric data. The xx represents the point number.

For more information on fault reporting, see Appendix A, Troubleshoot Your Module on page 87.

Table 9 - 5069 Compact I/O Digital Input Module - Fault and Data Status Tags

Data Type	Tag Name(1)	Triggering Event That Sets Tag
Fault	ConnectionFaulted(2)	The owner-controller loses its connection to the module.
	Counterxx.Fault	The counter data quality is bad.
	Ptxx.Fault	The point data quality is bad.
	Eventx.CounterxxFault	The corresponding counter had a fault indicated when the event occurred.
	Eventx.Fault	The signal connection is lost.
	Eventx.Ptxx.Fault	The signal connection is lost.
Status	RunMode	The module is in Run Mode.
	DiagnosticActive	
	DiagnosticSequenceCount	The count increments a diagnostic.
	Counterxx.Data	The counter data is scaled in engineering units.
	Counterxx.Uncertain	The counter data can be imperfect.
	Eventx.PtxxData	The event point data is scaled in engineering units.
	Eventx.Uncertain	The event data can be imperfect.
	Ptxx.Data	The point data is scaled in engineering units.
	Ptxx.Uncertain	The point data can be imperfect.
	Uncertain(2)	The module is operating outside its designed operating range if data is under manual or override control.

(1) Not all tag names apply to all 5069 Compact I/O digital input modules.
(2) This tag provides module-wide data an affects all channels simultaneously.

Digital Output Modules Features

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Module Features

The following features are specific to 5069 Compact I/O™ digital output modules.

- Multiple Output Point Densities
- Output State Change Time
- Configurable Channel-level Output State in Program Mode or Fault Mode
- Connection Fault Handling
- Module Health Diagnostics
- Forcing
- Data Echo
- No Load Detection - 5069-OB16 and 5069-OB16F modules only
- Short Circuit Protection - 5069-OB16 and 5069-OB16F modules only
- Thermal Shutoff - 5069-OB16 and 5069-OB16F modules only
- Time-scheduled Output Control - 5069-OB16F module only
- Isolated and Non-isolated Varieties of Output Modules - 5069-OW4I and 5069-OX4I modules only

Multiple Output Point Densities

5069 Compact I/O digital output modules use either 4-point or 16-point densities. The module catalog number indicates the point density. For example, the 5069-OB16 module has 16 outputs, and the 5069-OW4I module has 4 outputs.

Output State Change Time

Table 10 lists the time that it takes for 5069 Compact I/O digital output module outputs to change state after a command.

Table 10 - Time for a Module Output to Change States

Module	Time[1]
5069-OB16	100 µs
5069-OB16F	10 µs
5069-OW4I	10 ms
5069-OX4I	15 ms

(1) The times that are listed in Table 10 are from the time the module receives the message.

Configurable Channel-level Output State in Program Mode or Fault Mode

You can configure individual output channels to specific states when the module is in Program mode or Fault mode. The following output states are available:

- Off
- On
- Hold last state

To see where to configure the output states in Program mode or Fault mode, see the following:

- 5069-OB16 module - page 82
- 5069-OB16F module - page 83
- 5069-OW4I module - page 84
- 5069-OX4I module - page 85

Connection Fault Handling

You can configure 5069 Compact I/O digital output module behavior when a connection fault occurs, that is, the connection between the owner-controller and the output module breaks.

You must define the following:

- Immediate output behavior when the connection breaks.
- Length of time that the output behaves as defined.
- Output behavior if the connection remains broken when the length of time that is defined previously expires.

Output Behavior Immediately After a Connection Fault

When the connection between an owner-controller and output module breaks, the output can behave in the following ways, depending on how the Fault Mode parameter is configured:

- Turn off - Default
- Transition to a specific, user-defined value.
- Hold its last state.

  If you configure the output to hold its last state, the output remains at that state value until the following occurs:
  - The connection to the owner-controller is re-established.
  - The output returns to normal operation, as defined in the module configuration.

The output state remains as commanded if Fault State Duration is set to Forever.

If the Fault State Duration is set to 1, 2, 5, or 10 seconds, the output state changes to a user-configurable Final Fault State after the specified time period elapses. For more information, see Final Fault State Value on page 50.

Fault State Duration After Connection Fault

If you configure the output to transition to a specific value after the connection breaks, you must define how long the output remains at the specified value before it transitions to a Final Fault State.

You can configure the output to remain at the specific value for the following times:

- Forever
- One second
- Two seconds
- Five seconds
- Ten seconds

After the Fault State Duration time expires, the output transitions to user-defined Final Fault State Value.

Final Fault State Value

The Final Fault State Value defines the value to which the output goes after the Fault State Duration time expires.

To see how to configure the Output State in Fault Mode, see page 118.

Output State Once Connection is Re-established

Once the connection between the owner-controller and output module is re-established, the output resumes normal operation.

To see where to configure the Connection Fault Handling parameters, see the following:

- 5069-OB16 module - page 82
- 5069-OB16F module - page 83
- 5069-OW4I module - page 84
- 5069-OX4I module - page 85

Module Health Diagnostics

Each digital output module has a status indicator on the front of the module that indicates module health. For more information on module health diagnostics, see Appendix A, Troubleshoot Your Module on page 87.

Forcing

Use a force to override data that your logic either uses or produces.

- Test and debug your logic.
- Temporarily maintain normal system operations when an input device has failed.

Use forces only as a temporary measure. They are not intended to be a permanent part of your application.

Make sure that you understand the following before using forces.

ATTENTION: Forcing can cause unexpected machine motion that could injure personnel. Before you use a force, determine how the force affects your machine or process and keep personnel away from the machine area.

- Enabling I/O or SFC forces causes your machine or process to go to another state or phase.
- Removing forces can still leave forces in the enabled state.
- If forces are enabled and you install a force, the new force immediately takes effect.

Enable Forces

For a force to take effect, you enable forces. You can only enable and disable forces at the controller level.

- You can enable I/O forces and SFC forces separately or simultaneously.
- You cannot enable or disable forces for a specific module, tag collection, or tag element.

Disable or Remove a Force

To stop the effect of a force and let your project execute as programmed, disable or remove the force.

- You can disable or remove I/O and SFC forces simultaneously or separately.
- When you remove a force on an alias tag, you also remove the force on the base tag.

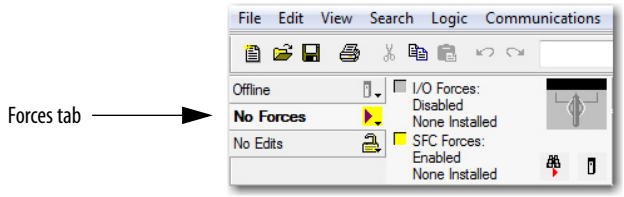
ATTENTION: Changes to forces can cause unexpected machine motion that could injure personnel. Before you disable or remove forces, determine how the change affects your machine or process and keep personnel away from the machine area.

Check Force Status

Before you use a force, determine the status of forces for the controller.

The Online toolbar shows the status of forces. It shows the status of I/O forces and SFC forces separately.

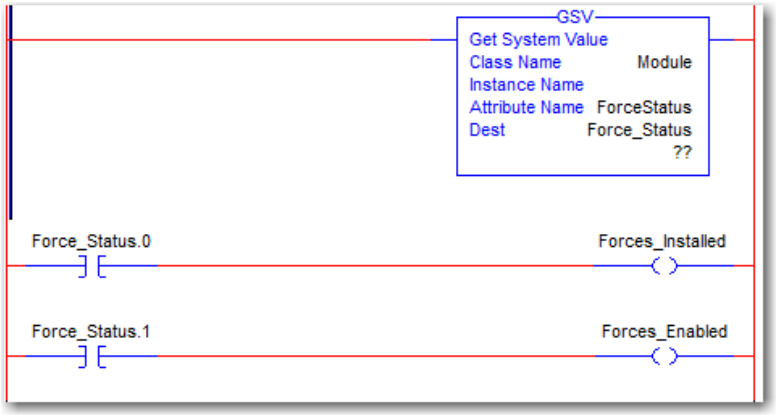
To determine the status of	Use any of the following
I/O forces	• Online toolbar • GSV instruction
SFC forces	Online toolbar



Forces Tab Status	Means
Enabled	• If the project contains any forces of this type, they are overriding your logic. • If you add a force of this type, the new force immediately takes effect
Disabled	Forces of this type are inactive. If the project contains any forces of this type, they are not overriding your logic.
Installed	At least one force of this type exists in the project.
None Installed	No forces of this type exist in the project.

GSV Instruction

This example shows how to use a GSV instruction to get the status of forces. For the purposes of this example, Force_Status is a DINT tag.



To determine the following	Examine this bit	For this value
Forces are installed	0	1
No forces are installed	0	0
Forces are enabled	1	1
Forces are disabled	1	0

Data Echo

Data Echo automatically multicasts point data values that match the digital value that was sent to the screw terminals of the module then.

A 5069 Compact I/O digital output module returns a value sent to it by the owner-controller. The echoed value is either On or Off.

Fault and status data are also sent. This data is sent at the RPI.

No Load Detection

No Load Detection detects when a wire is disconnected from the output or a missing load for each output point in the Off state.

The No Load Detection feature is disabled by default. You must enable the feature in your Logix Designer application project.

IMPORTANT This feature is available only on the 5069-OB16 and 5069-OB16F modules.

The output circuit on a digital output module uses a current-sensing optoisolator in parallel with the output transistor. Current flows through this sensing circuitry only when the output is Off.

The 5069-OB16 and 5069-OB16F digital output modules support the following minimum load currents:

- 5069-OB16 module = 3 mA for open load diagnostics, 1 mA for diagnostics disabled
- 5069-OB16F module= 3 mA for open load diagnostics, 1 mA for diagnostics disabled

In the On state, the module must be connected to a load that draws a minimum current equal to these values.

IMPORTANT An output must remain in the off state a minimum of 250 ms for an open load to be detected.

The *I.Ptxx.NoLoad* tag indicates the presence of a no load condition when it is set to 1.

You can monitor a module tag in your program that corresponds to the No Load Detection to check for a fault. For more information on the tag, see Chapter 4, Module Tag Definitions on page 97.

To see where to configure the No Load Detection feature, see the following:

- 5069-OB16 module - page 82
- 5069-OB16F module - page 83

Short Circuit Protection

IMPORTANT This feature is available only on the 5069-OB16 and 5069-OB16F modules.

Short Circuit Protection prevents damage to the output that can result when more current is present at the output than it can handle.

When a short circuit condition is detected, the following occurs:

- The output turns off.
- The I/O status indicator for the output becomes steady red.
- The I.Pt*xx*.ShortCircuit tag is set to 1.

  For more information on how to use the module tags, see Appendix B, Module Tag Definitions on page 97.

When the short circuit condition is removed, the following occurs:

- The output restarts in its commanded state.
- The I/O status indicator for the output turns off.
- The I.Pt*xx*.ShortCircuit tag is reset to 0.

For more information on the maximum current that you can apply to an output, see the 5069 Compact I/O Modules Specifications Technical Data, publication 5069-TD001.

Thermal Shutoff

IMPORTANT This feature is available only on the 5069-OB16 and 5069-OB16F modules.

Thermal Shutoff prevents damage to the output that can result when an output gets hotter than it can handle.

This feature is **directly related to Short Circuit Protection** feature. The increased temperature at the output results from an excessive load at the output. That is, a load with high current is applied to the output. The high current heats the output beyond an acceptable temperature and the output turns off.

When conditions exist that cause Thermal Shutoff to turn off the output, the following occurs:

- The output turns off.
- The I/O status indicator for the output becomes solid red.
- The I.Pt*xx*.ShortCircuit tag is set to 1.

  For more information on how to use the module tags, see Appendix B, Module Tag Definitions on page 97.

When the conditions that caused a Thermal Shutoff no longer exist, the following occurs:

- The output restarts in its commanded state.
- The I/O status indicator for the output turns off.
- The I.Pt*xx*.ShortCircuit tag is reset to 0.

Time-scheduled Output Control

You can schedule times for module outputs to turn On or Off. The time schedules use units in nanoseconds.

IMPORTANT This feature is available only on the 5069-OB16F module.

The timing of scheduled outputs for the 5069-OB16F module is as follows:

- ±10 µs accuracy
- 1 ns resolution

The module must be time synced or schedules are note applied.

Time-scheduled output control is used with the Motion Arm Output Cam (MAOC) instruction. The MAOC instruction enables position-based output control in these ways:

- Uses the position of any motion axis in a Logix5000™ control system as the position reference
- Updates outputs based on the motion axis position at the motion group coarse update rate, typically 1...32 ms

The instruction can update standard digital output modules at the coarse update rate. However, some high-speed applications require a higher degree of accuracy.

The 5069-OB16F scheduled output module improves the accuracy of the MAOC instruction by supporting the ability to schedule output On and Off times. All scheduling configuration for the On and Off times of an output is completed through the MAOC instruction. The instruction then updates values in the output tags of the module that define the scheduled output behavior.

Table 11 - 5069-OB16F Digital Output Module Schedule Parameters

Feature	5069-OB16F
Number of schedules	32
Output points available for scheduling	16 (points 0…15)
Remote operation	N/A
Minimum schedule interval(1)	100 µs For schedules output the MAOC instruction, you can use 50 µs.

(1) The MAOC limits the minimum schedule interval (minimum pulse width) to 1/16 of the coarse update period.

You can add a MAOC instruction to your ladder logic diagram and configure the parameters as required for your application. For more information on how to use an MAOC, see the following:

- Logix5000 Controllers Motion Instructions Reference Manual, publication MOTION-RM002
- Position-based Output Control with the MAOC Instruction Application Technique, publication 1756-AT017

Isolated and Non-isolated Varieties of Output Modules

The 5069-OW4I and 5069-OX4I digital output modules provide point-to-point wiring isolation.

IMPORTANT Although some 5069 Compact I/O digital I/O modules provide do not provide wiring isolation, all 5069 Compact I/O modules maintain internal electrical isolation between the system-side and field-side power buses.

Fault and Status Reporting

The digital output modules multicast fault and status data with channel data to the owner and listening controllers. The data is returned via module tags that you can monitor in your Logix Designer application.

IMPORTANT For the **5069-OB16 and 5069-OB16F output modules only**, an output must remain in the on state for a minimum of 250 ms for an overload or short circuit to be detected. However, if a short circuit condition exists long term, it is detected as long as the output is switching at a rate no faster than 1 ms.

For more information on fault reporting, see Appendix A, Troubleshoot Your Module on page 87.

Table 12 - 5069 Compact I/O Digital Output Module - Fault and Data Status Tags

Data Type	Tag Name(1)	Triggering Event That Sets Tag
Fault	ConnectionFaulted(2)	The owner-controller loses its connection to the module.
	Ptxx.Fault	The point data quality is bad.
	Ptxx.NoLoad	A no load condition exists on the point.
	Ptxx.ShortCircuit	A short circuit condition exists on the point.
Status	RunMode	The module is in Run Mode.
	DiagnosticActive	
	DiagnosticSequenceCount	The count increments a diagnostic.
	Ptxx.Data	The point data is scaled in engineering units.
	Ptxx.Uncertain	The point data can be imperfect.
	Uncertain(2)	The module is operating outside its designed operating range if data is under manual or override control.

(1) Not all tag names apply to all 5069 Compact I/O digital I/O modules.
(2) This tag provides module-wide data an affects all channels simultaneously.

Configure the Module

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Edit 5069-IB16F Module Configuration Categories	70
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This chapter describes how to configure your 5069 Compact I/O™ digital I/O modules in a Logix Designer application project. You can use the default module configuration or edit the module configuration.

IMPORTANT Consider the following:

- You must use the Logix Designer application, version 28 or greater, to configure the 5069 Compact I/O modules. Version 28 or greater is slightly different from previous programming software versions. For example, in some cases, instead of tabs across the top of the Module Properties dialog box, the application uses categories on the left side of the dialog box.
- This chapter does not explain the user-configurable module features that you can edit on different screens in your Logix Designer application project.

  For detailed information about module features, see the following:
  - Chapter 2, Common Digital I/O Module Features
  - Chapter 3, Digital Input Module Features
  - Chapter 4, Digital Output Modules Features

Before You Begin

You must complete the following tasks before you can configure the module:

1. Create a Logix Designer application project.

   The example in this chapter uses a 1756-L85E ControlLogix controller.

2. Add a 5069-AEN2TR EtherNet/IP adapter to the project.

   For more information on how to add a 5069-AEN2TR EtherNet/IP adapter, see the EtherNet/IP Communication Modules in 5000 Series Systems User Manual, publication ENET-UM004.

Create a New Module

After you create a Logix Designer application project and add a 5069-AEN2TR EtherNet/IP adapter to the project, complete the following steps to create a module in the project.

There are two methods to add modules to your Logix Designer application project.

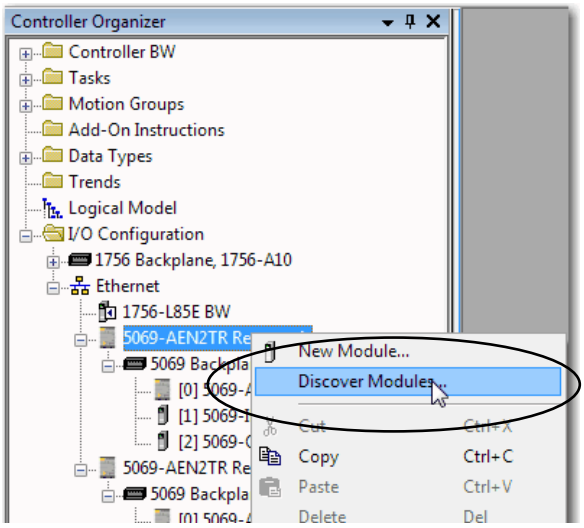
- Discover Modules
- New Module

Discover Modules

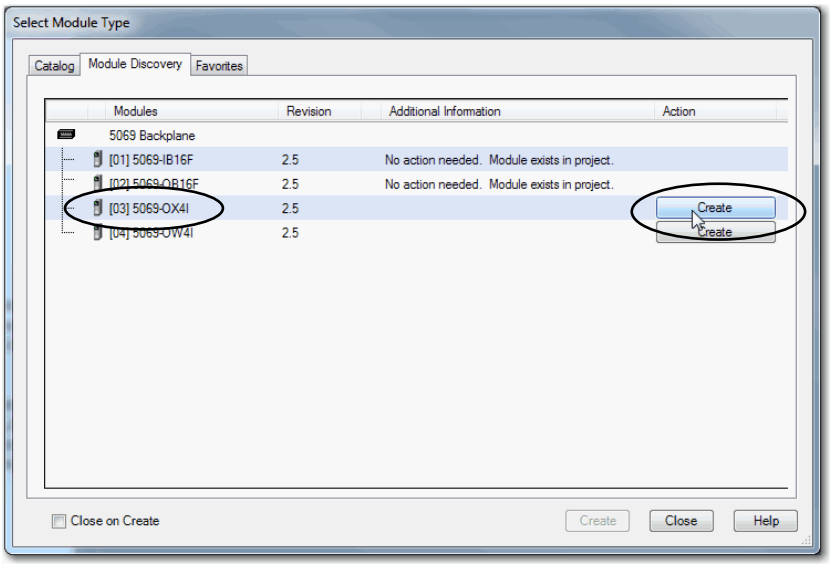
To add a module using Discover Modules, perform the following steps.

1. Go online with your Logix Designer application.
2. Right-click the 5069-AEN2TR EtherNet/IP adapter and choose Discover Modules.

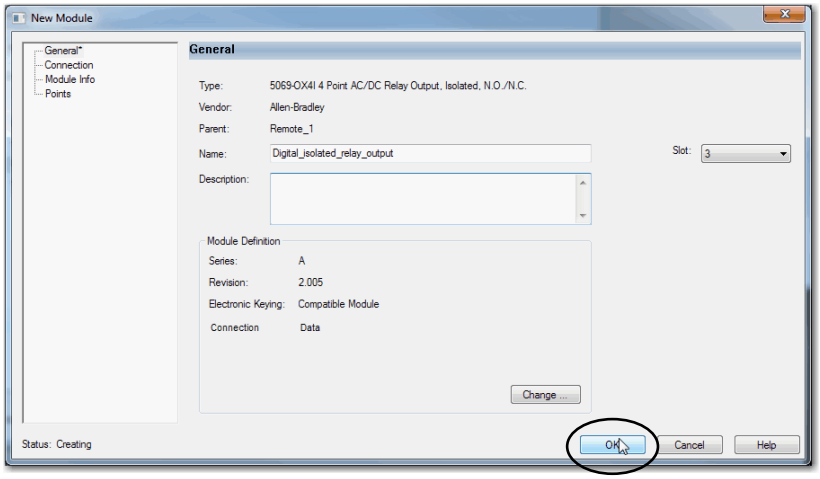
   The Logix Designer application automatically detects available modules that are connected to the backplane.



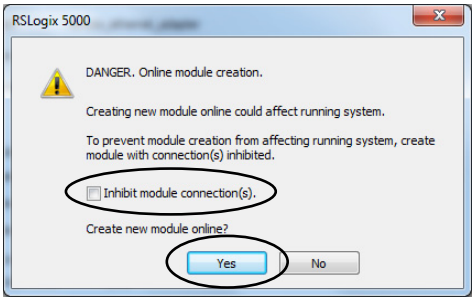
3. At the Select Module Type window, click Create to add the discovered module to your project.



4. At the New Module window, configure the module properties and click OK.



5. At the warning dialog box, make sure that Inhibit module connection(s) is selected and click Yes.

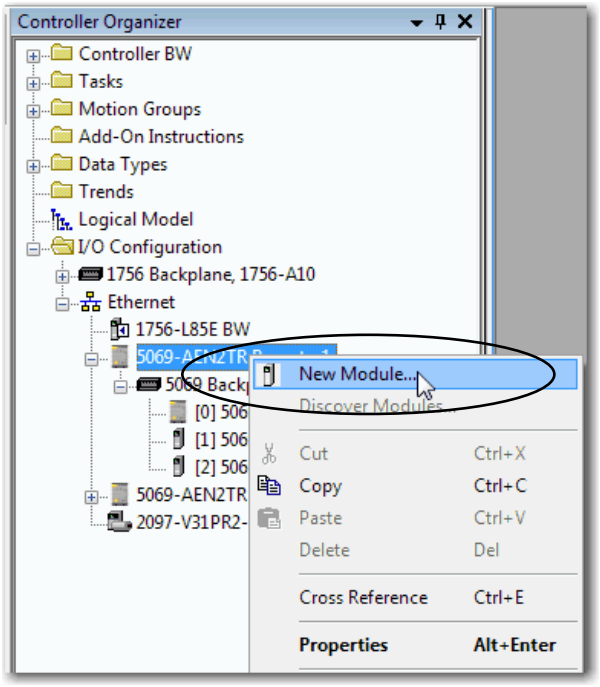


6. Close the Select Module Type dialog box.

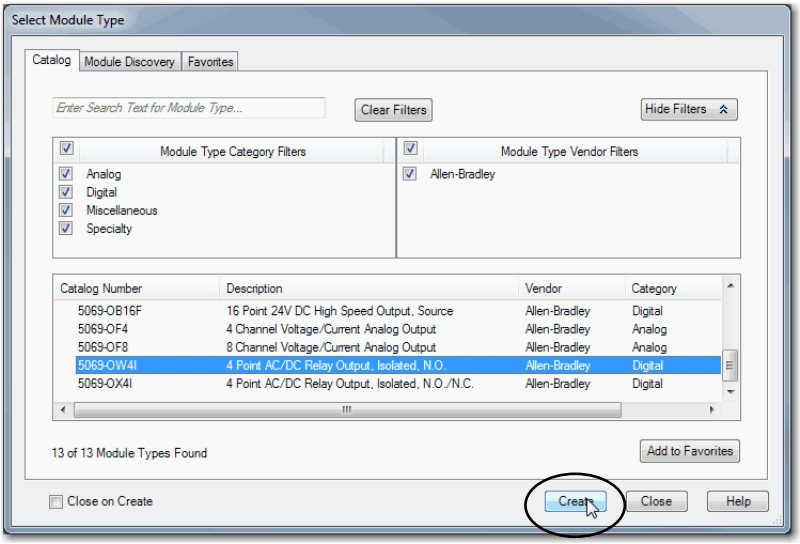
New Module

To add a module using New Module, perform the following steps.

1. Right-click the 5069-AEN2TR EtherNet/IP adapter and choose New Module.

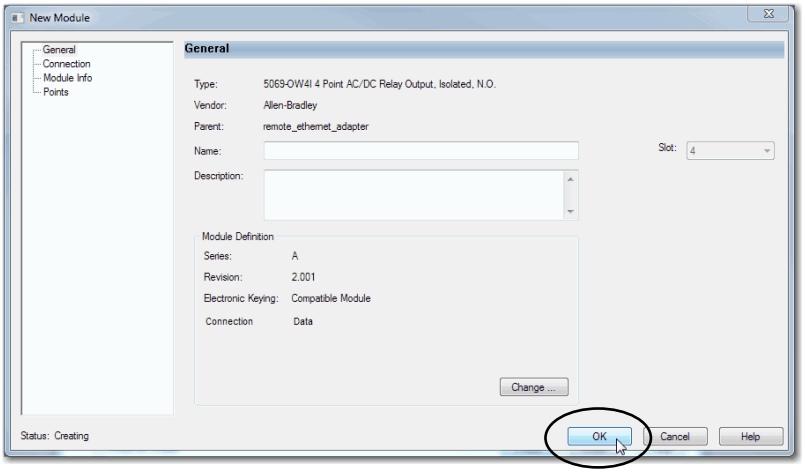


2. Select the module and click Create.



The New Module dialog box appears with a list of categories on the left side. The number and type of categories varies by module type.

3. You can click OK to use the default configuration as shown or edit the module configuration. The rest of this chapter describes how to edit module configuration categories.



Edit the Module Configuration Common Categories

You click the category names in the New Module dialog box to view and change the configuration parameters.

IMPORTANT This chapter shows how to edit configuration when you add the module to the Logix Designer application project.

If you access the module configuration after it is added to the project, the dialog box is named Module Properties. The same categories are displayed as the categories displayed on the New Module dialog box.

Some new module configuration categories apply to all 5069 Compact I/O digital I/O modules. Some categories are specific to the module type.

For example purposes, the figures in this section are from a 5069-IB16 module.

The following categories apply to all 5069 Compact I/O digital I/O modules and are described in this section.

- General Category
- Connection Category
- Module Info Category

General Category

The General category appears first when you create a module. The parameters in this category are the same for all 5069 Compact I/O digital I/O modules.

You use this category to complete the following optional tasks:

- Name the module.
- Assign a slot number. (required)
- Describe the module.
- Access the Module Definition.

Module Definition

Module Definition parameters are available on the General tab of the Module Properties dialog box in the Logix Designer application project.

Table 13 describes the parameters on the Module Definition dialog box.

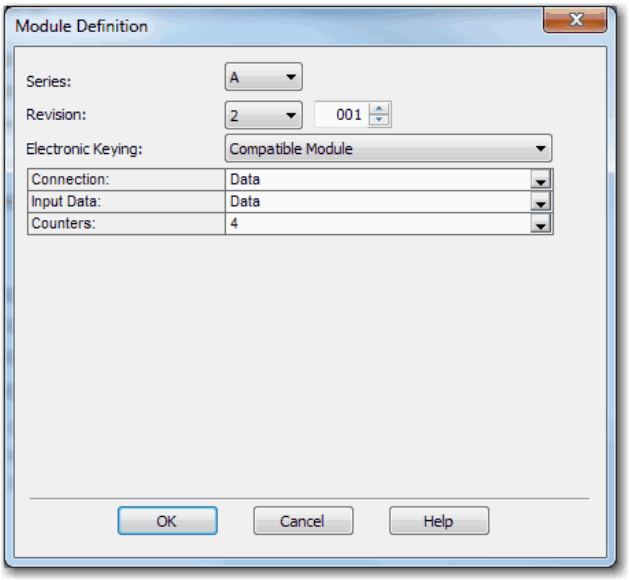


Table 13 - Module Definition Parameters

Parameter	Definition	Available Choices[1]
Series	Module hardware series	Module-specific
Revision	Module firmware revision, including major and minor revision levels	Module-specific
Electronic Keying	Software method by which you reduce the possibility of using the wrong device in a control system. For more information, see the following: • View the Module Tags on page 86 • Electronic Keying in Logix5000 Control Systems Application Technique, publication LOGIX-AT001	Exact Match Compatible Module Disable Keying
Connection	Determines the following for the module type you configure: • Available configuration parameters • Data type transferred between the module and the controller • Which tags are generated when configuration is complete	Data Data with Events Listen Only Data[2]
Input Data - Input modules only	All available configurations, input data. This connection type creates all controller tags specific to the module type being used.	Data Timestamped Data Packed Data
Counters - Input modules only	Determines the number of counters that are used for the module type.	None 2 4 8
Output Data - Output modules only	All available configurations, output data. This connection type creates all controller tags specific to the module type being used.	Data Scheduled Data Packed Data

(1) All available choices are not available for all modules.
(2) Controller and module establish communication without the controller sending any configuration or output data to the module. A full input data connection is established but depends on the connection between the owner-controller and the module.

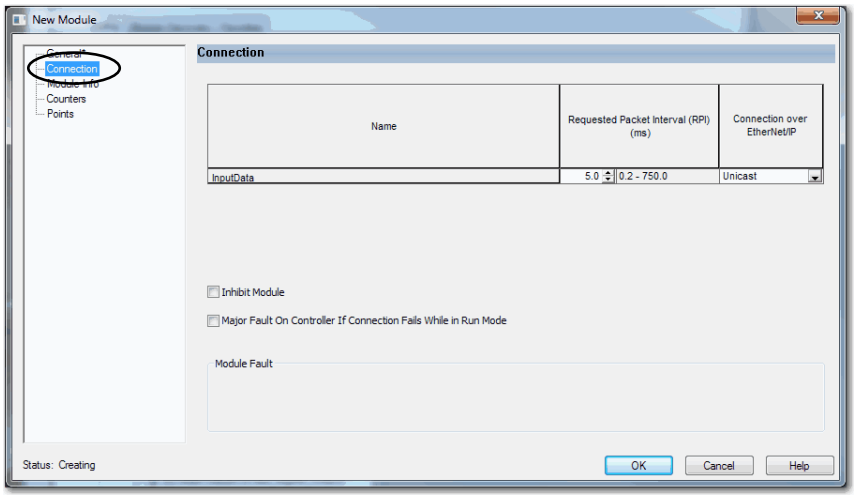
Connection Category

The Connection category lets you complete the following tasks:

- Set the RPI rate. For more information on the RPI, see Requested Packet Interval on page 16.
- Set the connection type over the EtherNet/IP network.

  For more information on unicast and multicast connections, see the EtherNet/IP Communication Modules in 5000 Series Systems User Manual, publication ENET-UM004
- Inhibit the module. For more information on how to inhibit the module, see page 28.
- Configure whether a connection failure while the controller is in Run module causes a major or minor fault.

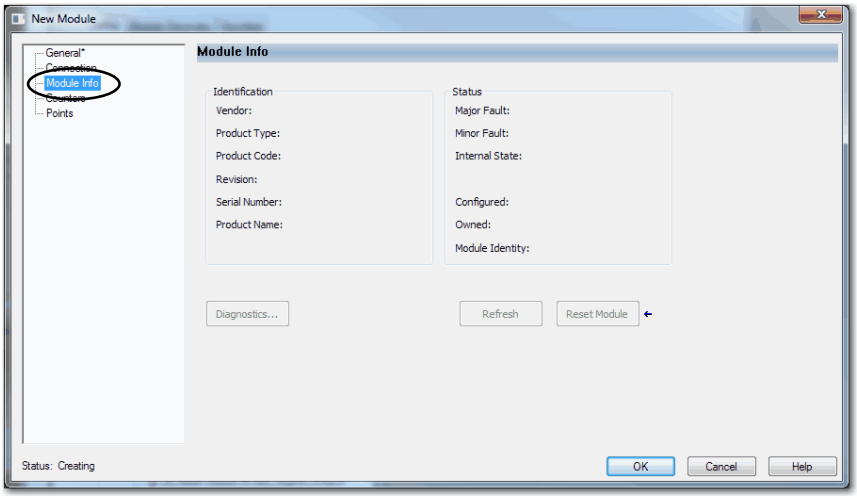
TIP The Module Fault area of the Connection category is useful during module troubleshooting. For more information on the Module Fault area, see page 94.



Module Info Category

The Module Info category displays module and status information about the module when the project is online. You can use this category to complete the following:

- Determine the identity of the module.
- Access module diagnostics.
- Refresh the data on the screen.
- Reset the module.



Edit 5069-IB16 Module Configuration Categories

In addition to the General, Connection, and Module Info categories, the following categories are available when you configure a 5069-IB16 module:

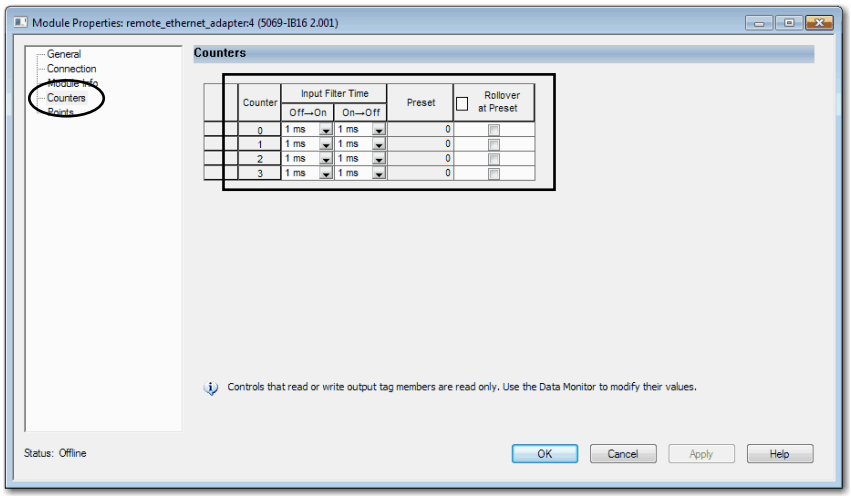
- Counters Category
- Points Category

IMPORTANT If you use the Listen Only connection type, the Points Category and Counters Category do not appear.

Counters Category

The Counters category is available only if you choose a value for Counters in the Module Definition dialog box.

The Counters category shows the configuration options available for each counter. Based on your Input Filter Time selections, the Input Filter Time Off→On and On→Off times change. You can also configure the counter Preset value and enable Rollover at Preset.



IMPORTANT The total number of Counters subtracts from the available number of Points. For example, if you configure a 5069-IB16 module to use 4 counters, the first four terminals are not available to use as points.

The number of points available on the module in this case is 12. That is, points 4…15.

Points Category

The Points category shows an overview of the configuration values for the points of the module. The values for each parameter indicate how that particular point is configured on the category of that point.

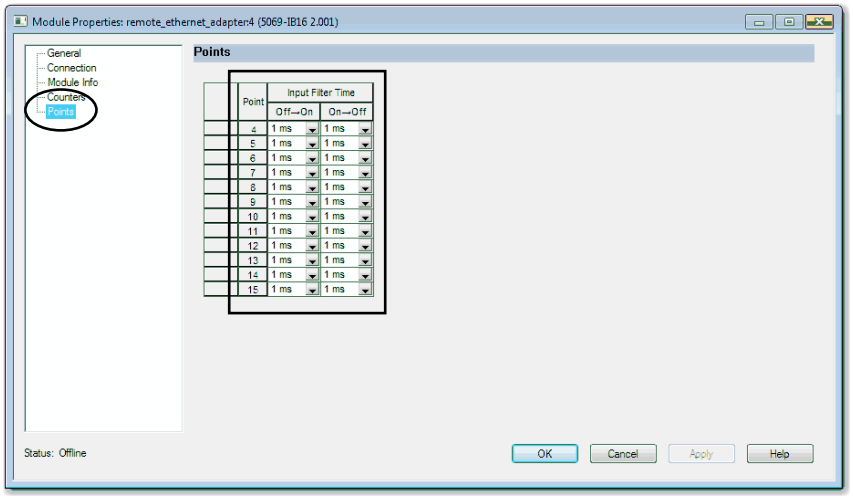
IMPORTANT

You can edit the fields on the Points category dialog box.

We recommend that you change the point configuration on the specific point categories as described in the rest of this section.

Use this view to monitor configuration for all channels on the module.

The Points category shows the configuration options available for each point. Based on your Input Filter Time selections, the Input Filter Time Off→On and On→Off times change.



Edit 5069-IB16F Module Configuration Categories

In addition to the General, Connection, and Module Info categories, the following categories are available when you configure a 5069-IB16F module:

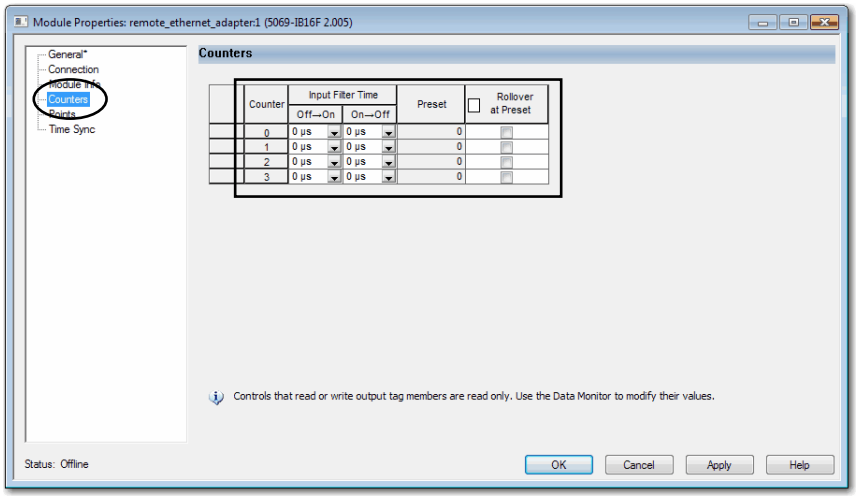
- Counters Category
- Points Category
- Events Category
- Time Sync Category

IMPORTANT If you use the Listen Only connection type, the Points Category, Counters Category, Events Category, and Time Sync Category do not appear.

Counters Category

The Counters category is available only if you choose a value for Counters in the Module Definition dialog box.

The Counters category shows the configuration options available for each counter. Based on your Input Filter Time selections, the Input Filter Time Off→On and On→Off times change. You can also configure the counter Preset value and enable Rollover at Preset.



IMPORTANT The total number of Counters subtracts from the available number of Points. For example, if you configure a 5069-IB16F module to use 4 counters, the first four terminals are not available to use as points.

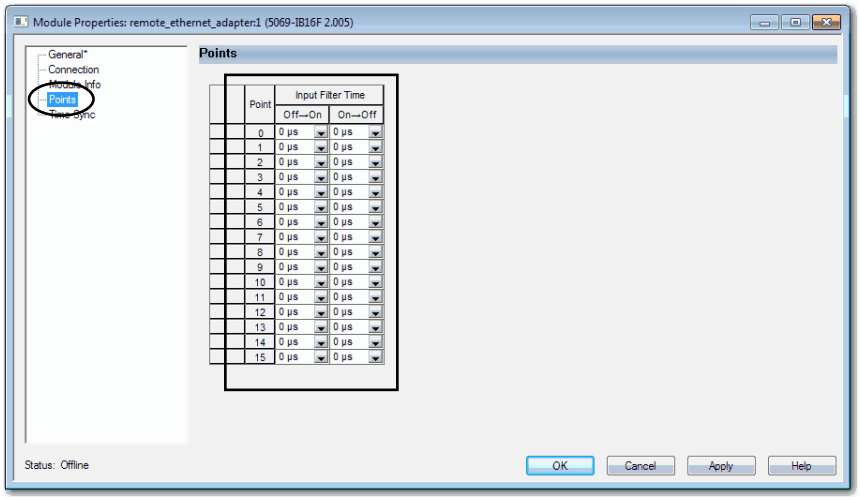
The number of points available on the module in this case is 12. That is, points 4…15.

Points Category

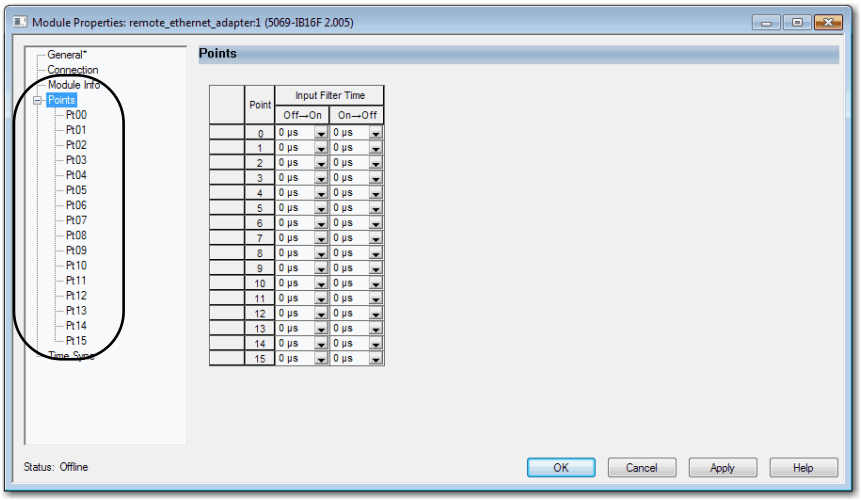
The Points category shows an overview of the configuration values for the points of the module. The values for each parameter indicate how that particular point is configured on the category of that point.

IMPORTANT	You can edit the fields on the Points category dialog box. We recommend that you change the point configuration on the specific point categories as described in the rest of this section. Use this view to monitor configuration for all channels on the module.

The Points category shows the configuration options available for each point. Based on your Input Filter Time selections, the Input Filter Time Off→On and On→Off times change.



If you choose Timestamped Data for Input Data in the Module Definition dialog box, the Points category expands.

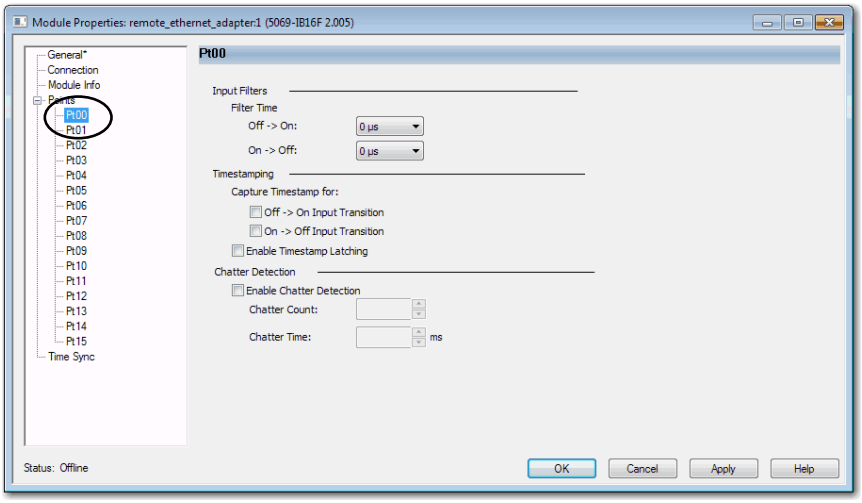


PTxx Category

The PT*xx* category shows the configuration options available when you use Timestamping on a point.

IMPORTANT You must choose the Input Data option Timestamp Data on the Module Definition dialog box to see this category in the Module Properties dialog box.

Click each Pt*xx* to configure it as necessary for your application.

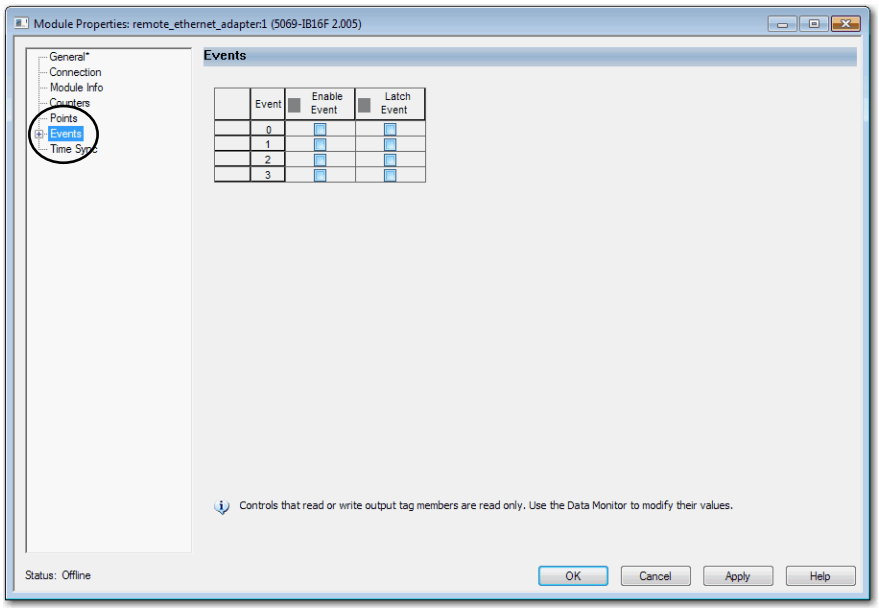


Events Category

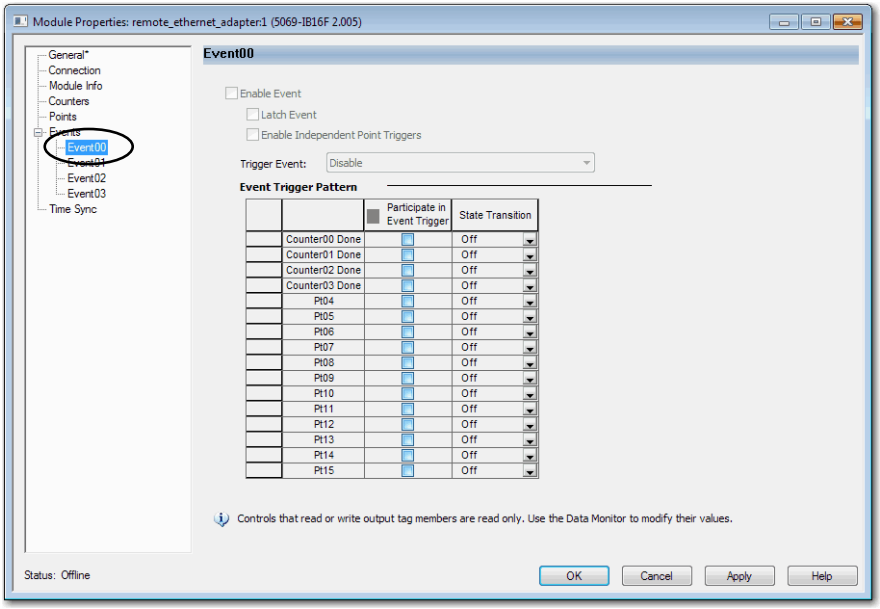
The Events category is available only if you choose Data with Events for Connection in the Module Definition dialog box. Click the + sign next to the Events category to expand it.

IMPORTANT You cannot configure events on the Module Properties dialog box. The parameters that are displayed are read-only.

You must use the Event Output tags to configure an event. For more information, see Configure an Event in the Event Output Tags on page 74.



The Events subcategories show the configuration parameters for events.



Configure an Event in the Event Output Tags

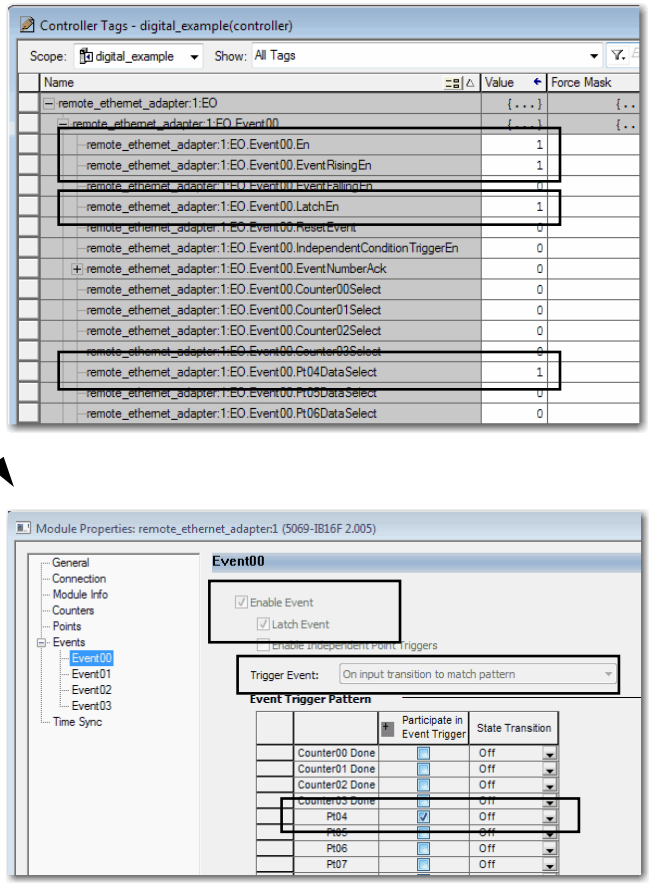
To configure an event, you must change the Event Output tags for the affected module via the Tag Monitor in the Logix Designer application. When you change the tags, the change is reflected on the Module Properties dialog box.

The following graphics show how tag values are reflected on the Module Properties. The following conditions are shown:

- Event is enabled
- Point 4 is configured to trigger the event
- Event is latched
- Trigger Event is on input transition to match pattern

These changes in the Event Output tags configure the event.

After the tags are changed, the related parameters on the Module Properties are updated automatically.



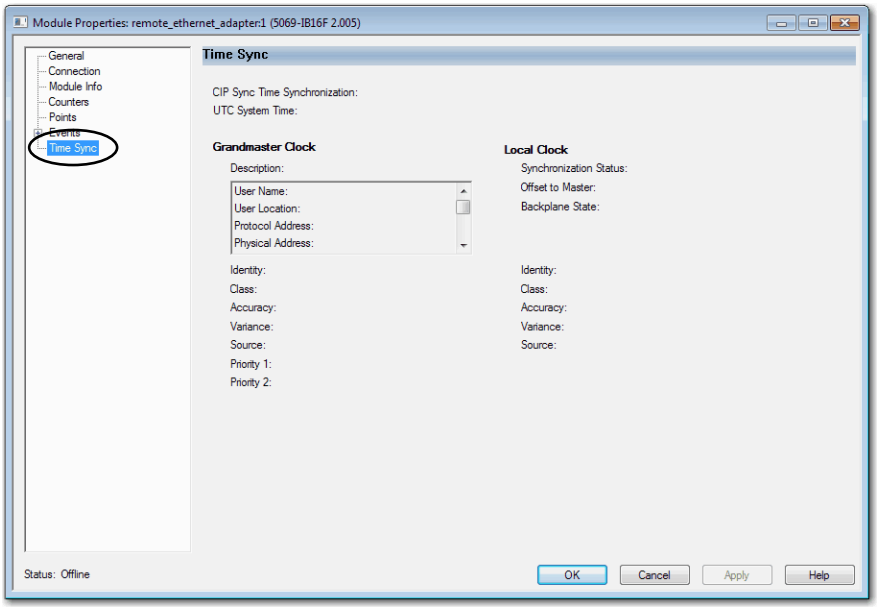
For more information on module tags, see the following:

- View the Module Tags on page 86
- Appendix B, Module Tag Definitions on page 97

Time Sync Category

The Time Sync category displays and status information about the module when the project is online. The Time Sync category displays the following information:

- CIP Sync Time Synchronization
- UTC System Time
- Grandmaster Clock information
- Local Clock information



Edit 5069-IB6F-3W Module Configuration Categories

In addition to the General, Connection, and Module Info categories, the following categories are available when you configure a 5069-IB6F-3W module:

- Points Category
- Counters Category
- Events Category
- Time Sync Category

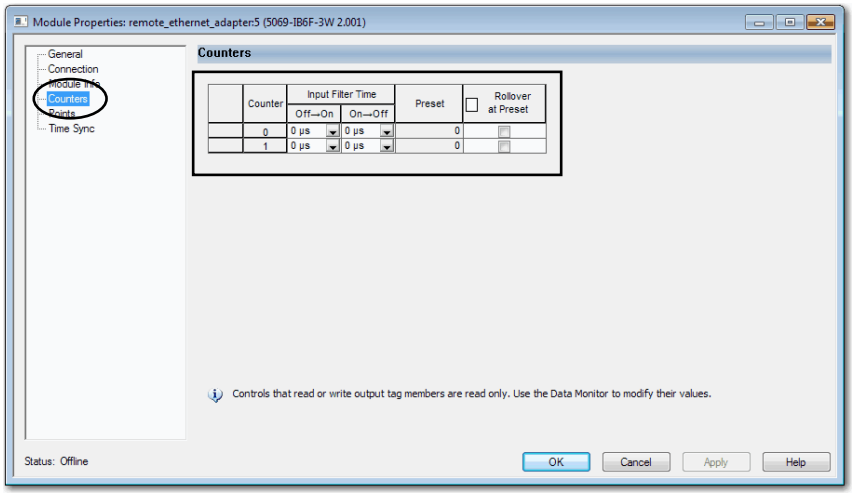
IMPORTANT If you use the Listen Only connection type, the Points Category, Counters Category, Events Category, and Time Sync Category do not appear.

Counters Category

The Counters category is available only if you choose a value for Counters in the Module Definition dialog box.

The Counters category for the 5069-IB6F-3W module functions the same as it does for the other 5069 Compact I/O digital input modules. The only difference is that the 5069-IB6F-3W module offers no more than 4 counters.

The Counters category shows the configuration options available for each counter. Based on your Input Filter Time selections, the Input Filter Time Off→On and On→Off times change. You can also configure the counter Preset value and enable Rollover at Preset.



IMPORTANT The total number of Counters subtracts from the available number of Points. For example, if you configure a 5069-IB6F-3W module to use two counters, the number of points available on the module is 4. That is, points 2...5.

Points Category

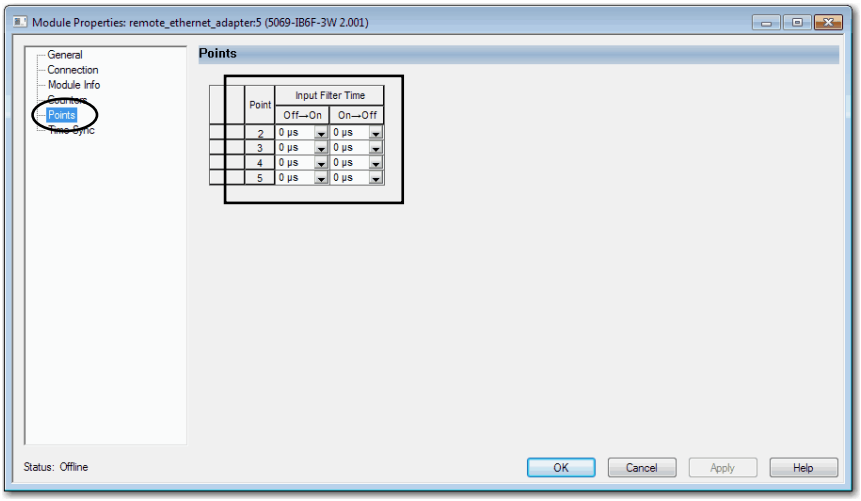
The Points category shows an overview of the configuration values for the points of the module. The values for each parameter indicate how that particular point is configured on the category of that point.

IMPORTANT You can edit the fields on the Points category dialog box.

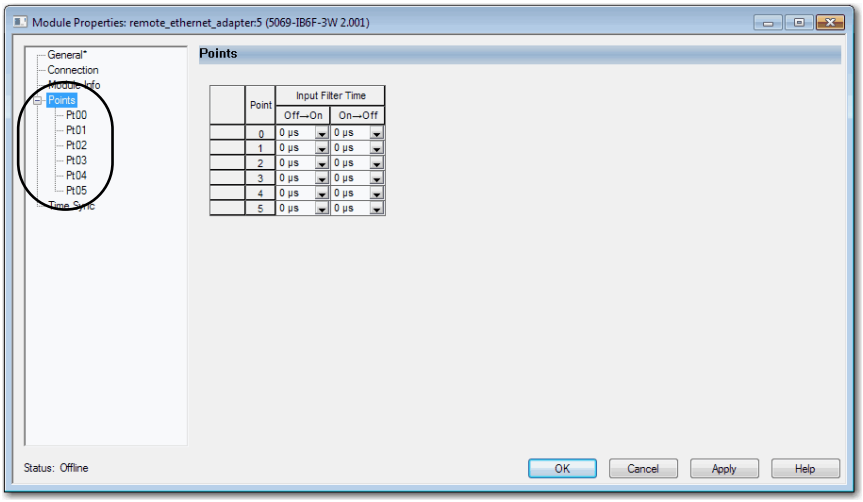
We recommend that you change the point configuration on the specific point categories as described in the rest of this section.

Use this view to monitor configuration for all channels on the module.

The Points category shows the configuration options available for each point. Based on your Input Filter Time selections, the Input Filter Time Off→On and On→Off times change.



If you choose Timestamped Data for Input Data in the Module Definition dialog box, the Points category expands.

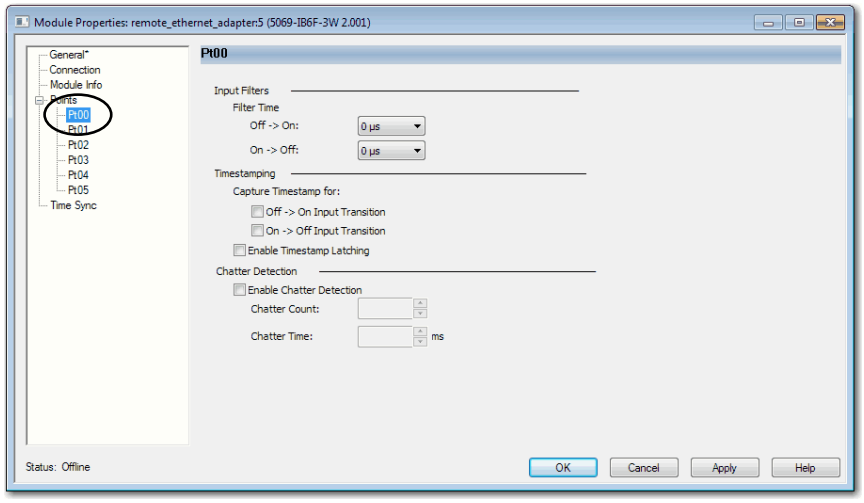


PTxx Category

The PT*xx* category shows the configuration options available when you use Timestamping on a point.

IMPORTANT You must choose the Input Data option Timestamp Data on the Module Definition dialog box to see this category in the Module Properties dialog box.

Click each Pt*xx* to configure it as necessary for your application.

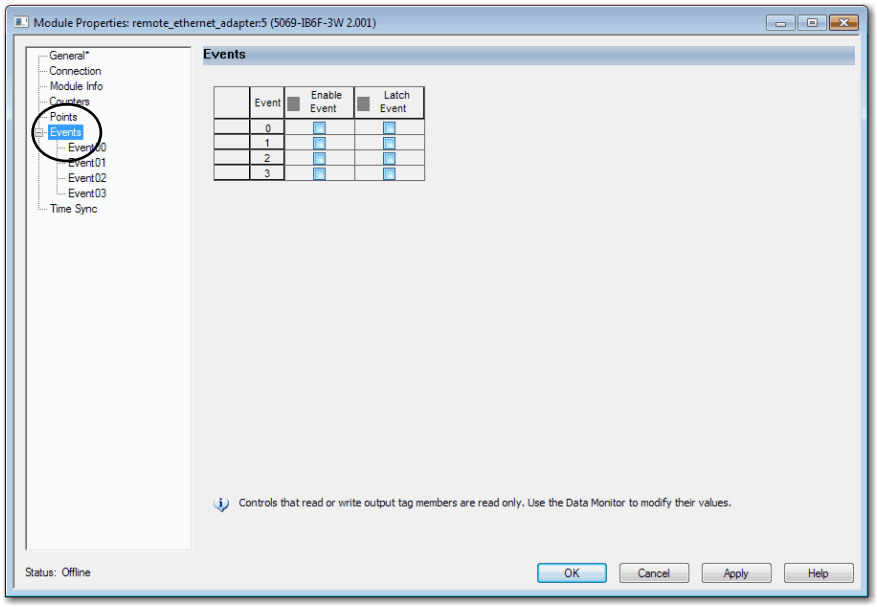


Events Category

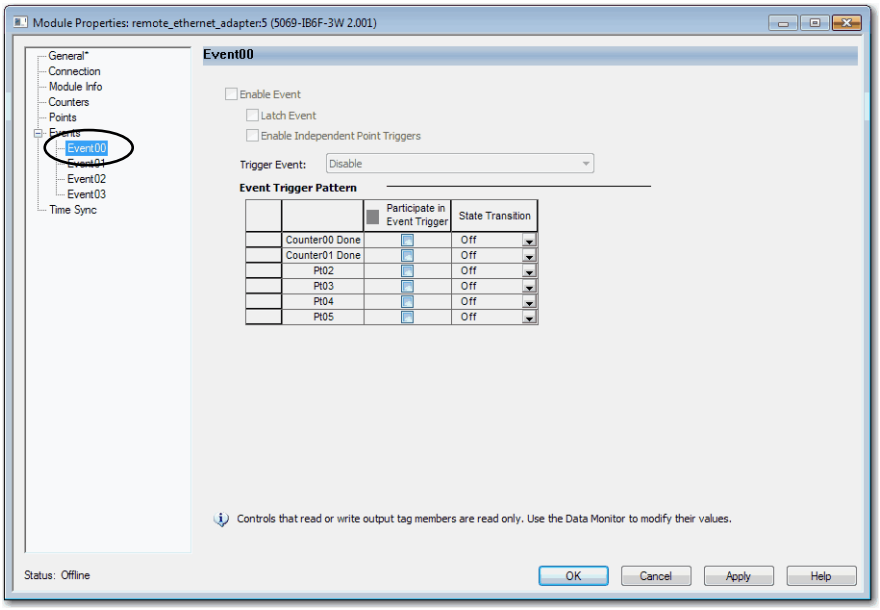
The Events category is available only if you choose Data with Events for Connection in the Module Definition dialog box. Click the + sign next to the Events category to expand it.

IMPORTANT You cannot configure events on the Module Properties dialog box. The parameters that are displayed are read-only.

You must use the Event Output tags to configure an event. For more information, see Configure an Event in the Event Output Tags on page 80.



The Events subcategories show the configuration parameters for events.



Configure an Event in the Event Output Tags

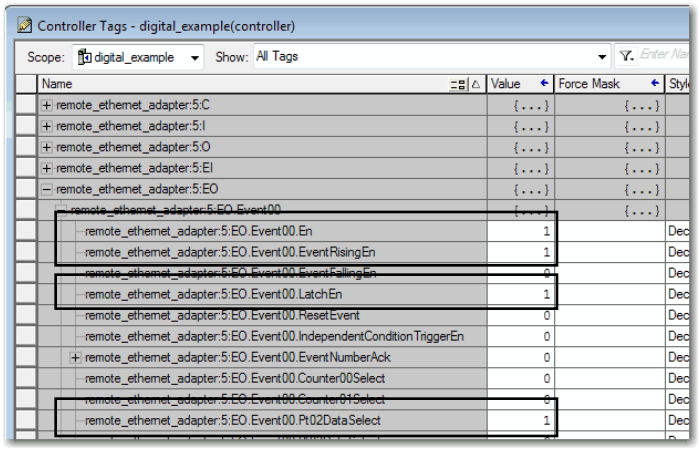
To configure an event, you must change the Event Output tags for the affected module via the Tag Monitor in the Logix Designer application. When you change the tags, the change is reflected on the Module Properties dialog box.

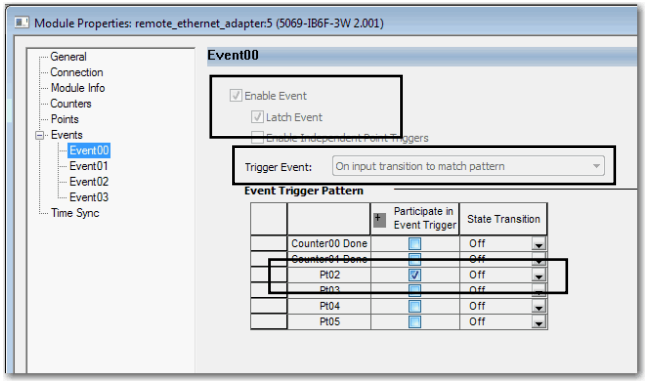
The following graphics show how tag values are reflected on the Module Properties. The following conditions are shown:

- Event is enabled
- Point 4 is configured to trigger the event
- Event is latched
- Trigger Event is On input transition to match pattern

These changes in the Event Output tags configure the event.

After the tags are changed, the related parameters on the Module Properties are updated automatically.





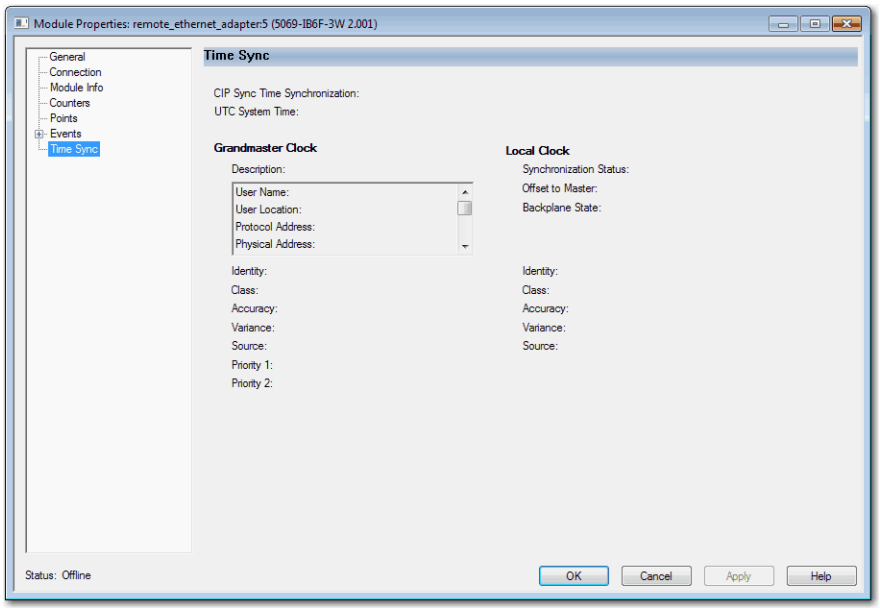
For more information on module tags, see the following:

- View the Module Tags on page 86
- Appendix B, Module Tag Definitions on page 97

Time Sync Category

The Time Sync category displays and status information about the module when the project is online. The Time Sync category displays the following information:

- CIP Sync Time Synchronization
- UTC System Time
- Grandmaster Clock information
- Local Clock information



Edit 5069-OB16 Module Configuration Categories

In addition to the General, Connection, and Module Info categories, the Points category is available when you configure a 5069-OB16 module.

IMPORTANT If you use the Listen Only connection type, the Points Category does not appear.

Points Category

The Points category shows an overview of the configuration values for the points of the module. The values for each parameter indicate how that particular point is configured on the category of that point.

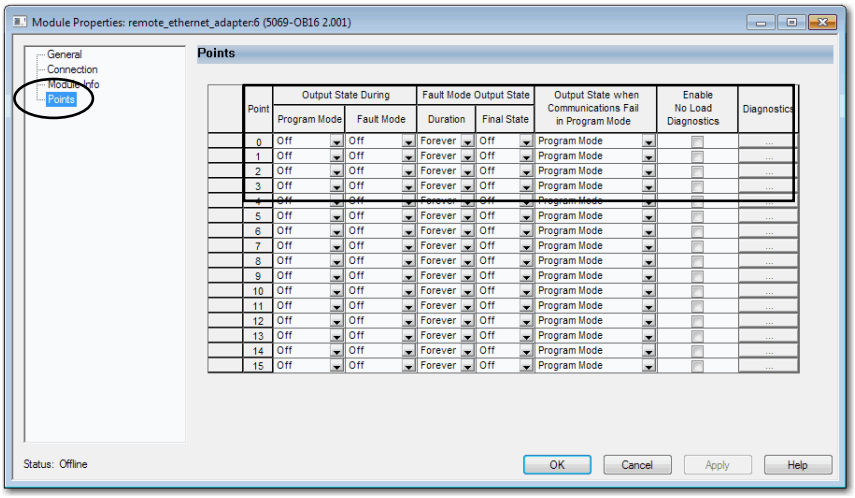
IMPORTANT You can edit the fields on the Points category dialog box.

We recommend that you change the point configuration on the specific point categories as described in the rest of this section.

Use this view to monitor configuration for all channels on the module.

The Points category shows the configuration options available for each point. You can configure the following parameters from the Points category:

- Enable No Load Diagnostics
- Output State During Program Mode
- Output State During Fault Mode
- Fault Mode Output State Duration
- Fault Mode Output State Final State
- Communication Failure Output State



Edit 5069-OB16F Module Configuration Categories

In addition to the General, Connection, and Module Info categories, the Points category is available when you configure a 5069-OB16F module.

IMPORTANT If you use the Listen Only connection type, the Points Category does not appear.

Points Category

The Points category shows an overview of the configuration values for the points of the module. The values for each parameter indicate how that particular point is configured on the category of that point.

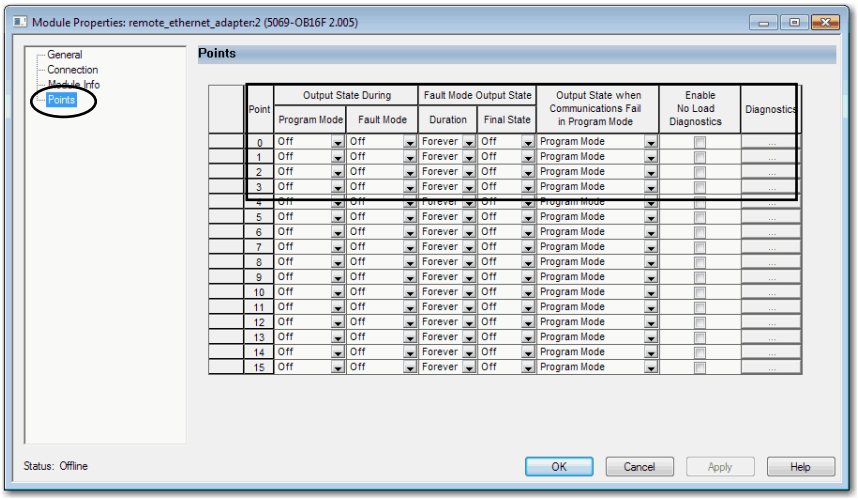
IMPORTANT You can edit the fields on the Points category dialog box.

We recommend that you change the point configuration on the specific point categories as described in the rest of this section.

Use this view to monitor configuration for all channels on the module.

The Points category shows the configuration options available for each point. You can configure the following parameters from the Points category:

- Enable No Load Diagnostics
- Output State During Program Mode
- Output State During Fault Mode
- Fault Mode Output State Duration
- Fault Mode Output State Final State
- Communication Failure Output State



Edit 5069-OW4I Module Configuration Categories

In addition to the General, Connection, and Module Info categories, the Points category is available when you configure a 5069-OW4I module.

IMPORTANT If you use the Listen Only connection type, the Points Category does not appear.

Points Category

The Points category shows an overview of the configuration values for the points of the module. The values for each parameter indicate how that particular point is configured on the category of that point.

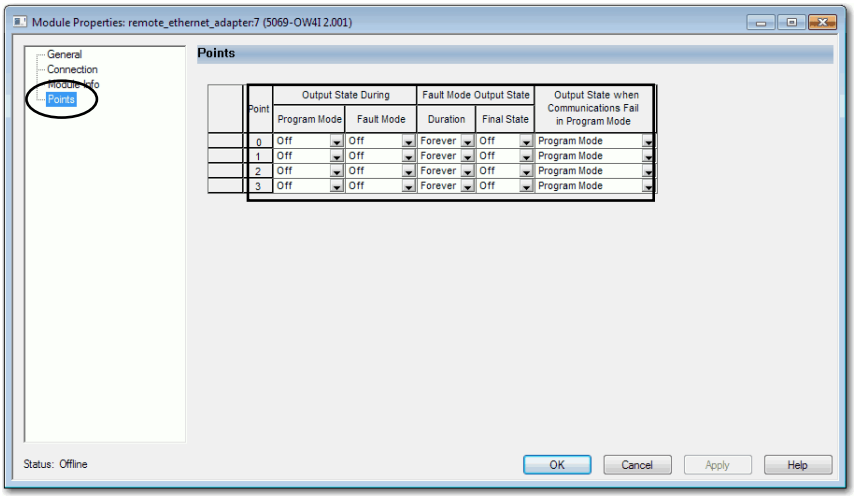
IMPORTANT You can edit the fields on the Points category dialog box.

We recommend that you change the point configuration on the specific point categories as described in the rest of this section.

Use this view to monitor configuration for all channels on the module.

The Points category shows the configuration options available for each point. You can configure the following parameters from the Points category:

- Output State During Program Mode
- Output State During Fault Mode
- Fault Mode Output State Duration
- Fault Mode Output State Final State
- Communication Failure Output State



Edit 5069-OX4I Module Configuration Categories

In addition to the General, Connection, and Module Info categories, the Points category is available when you configure a 5069-OX4I module.

IMPORTANT If you use the Listen Only connection type, the Points Category does not appear.

Points Category

The Points category shows an overview of the configuration values for the points of the module. The values for each parameter indicate how that particular point is configured on the category of that point.

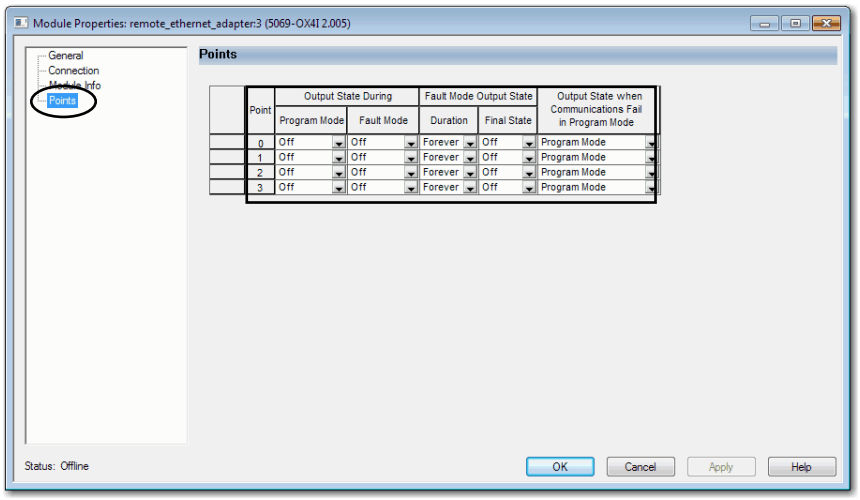
IMPORTANT You can edit the fields on the Points category dialog box.

We recommend that you change the point configuration on the specific point categories as described in the rest of this section.

Use this view to monitor configuration for all channels on the module.

The Points category shows the configuration options available for each point. You can configure the following parameters from the Points category:

- Output State During Program Mode
- Output State During Fault Mode
- Fault Mode Output State Duration
- Fault Mode Output State Final State
- Communication Failure Output State

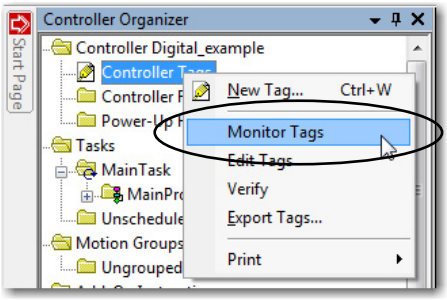


View the Module Tags

When you create a module, the Logix Designer application creates a set of tags that you can view in the Tag Editor. Each configured feature on your module has a distinct tag that is available for use in the controller program logic.

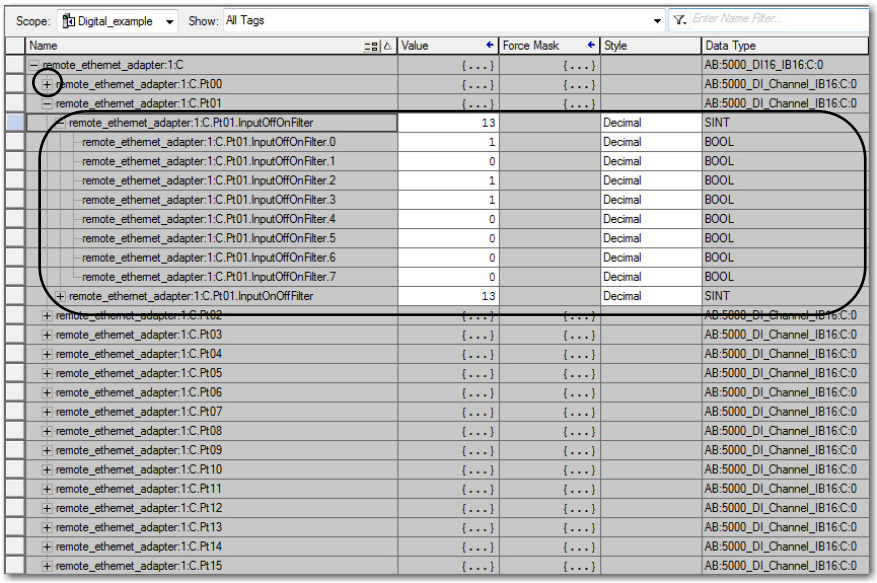
Complete the following steps to access the tags for a module.

1. In the Controller Organizer, right-click Controller Tags and choose Monitor Tags.



   The Controller Tags dialog box appears with data.

2. To view the tags, click the + symbols as shown.



For more information on module tags, see Appendix B, Module Tag Definitions on page 97.

Troubleshoot Your Module

Topic	Page
Module Status Indicator	87
5069 Compact I/O Digital Input Modules Status Indicators	89
5069 Compact I/O Digital Output Modules Status Indicators	90
Use the Logix Designer Application for Troubleshooting	92

5069 Compact I/O™ digital I/O modules use the following status indicators:

- Module (MOD) Status Indicator - This indicator operates the same for all 5069 Compact I/O digital I/O modules.
- I/O Status Indicator - This indicator operates differently based on the module type.

Module Status Indicator

Table 14 describes the Module (MOD) Status indicator on 5069 Compact I/O digital I/O modules.

Table 14 - Module Status Indicator - 5069 Compact I/O Digital I/O Modules

Indicator State	Description	Recommended Action
Off	The module is not powered.	None if your application does not use the module If your application uses the module and it is expected to be operating, complete the following: • Confirm that the system is powered. • Confirm that the module is installed properly.
Steady Green	The module has a connection to the owner-controller and is operating normally.	None

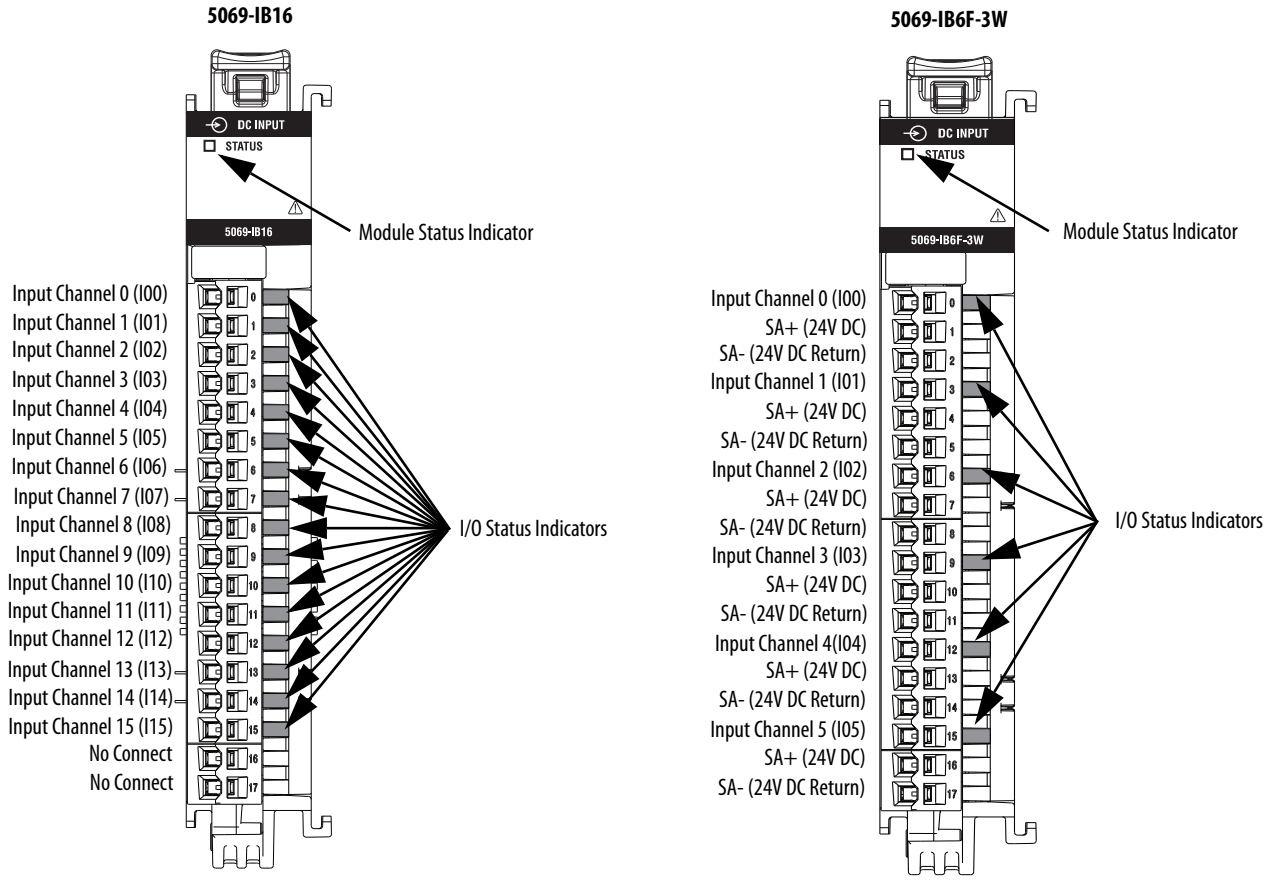
Table 14 - Module Status Indicator - 5069 Compact I/O Digital I/O Modules

Indicator State	Description	Recommended Action
Flashing green	The following conditions exist: • The module is powering up. • The module has powered up successfully. • One of the following: – The module does not have a connection to the controller. A connection can result from missing, incomplete, or incorrect module configuration. – The module has a connection to the controller and the controller is in Program mode.	Complete the following: • Troubleshoot your Logix Designer application to determine what is preventing a connection from the module to the controller and correct the issue. • Confirm that the system conditions require the controller to be in Remote Run mode or Run mode, transition the controller to one of those modes.
Steady red	The module experienced a nonrecoverable fault.	Complete the following actions: 1. Cycle power to the module. 2. If the status indicator remains in the steady red state, replace the module.
Flashing red	One of the following conditions exist: • A module firmware update is in progress. • A module firmware update attempt failed. • The device has experienced a recoverable fault. • A connection to the module has timed out.	Complete one of the following: • Let the firmware update progress complete. • Re-attempt a firmware update after one fails. • Use the Logix Designer application to determine the cause of the module fault. The Connection and Module Info categories of the module's configuration indicate the fault type. To clear a recoverable fault, complete one of the following: – Cycle module power. – Click Reset Module in the Logix Designer project via the Module Info category of the Module Properties dialog box. If the fault does not clear after cycling power and clicking Reset Module, contact Rockwell Automation Technical Support. • Use the Logix Designer application to determine if a connection has timed out. The Connection category in the Module Properties for the module indicates the module state, including if a connection has timed out. If a connection has timed out, determine the cause and correct it. For example, a cable failure can cause a connection timeout.

5069 Compact I/O Digital Input Modules Status Indicators

Figure 5 shows the 5069 Compact I/O digital input modules status indicators.

Figure 5 - 5069 Compact I/O Digital Input Module Status Indicators



IMPORTANT: The 5069-IB16F module status indicators appear the same as the indicators are shown on the 5069-IB16 module.

5069 Compact I/O Digital Input Modules I/O Status Indicators

Table 15 describes the 5069 Compact I/O digital input modules I/O status indicators.

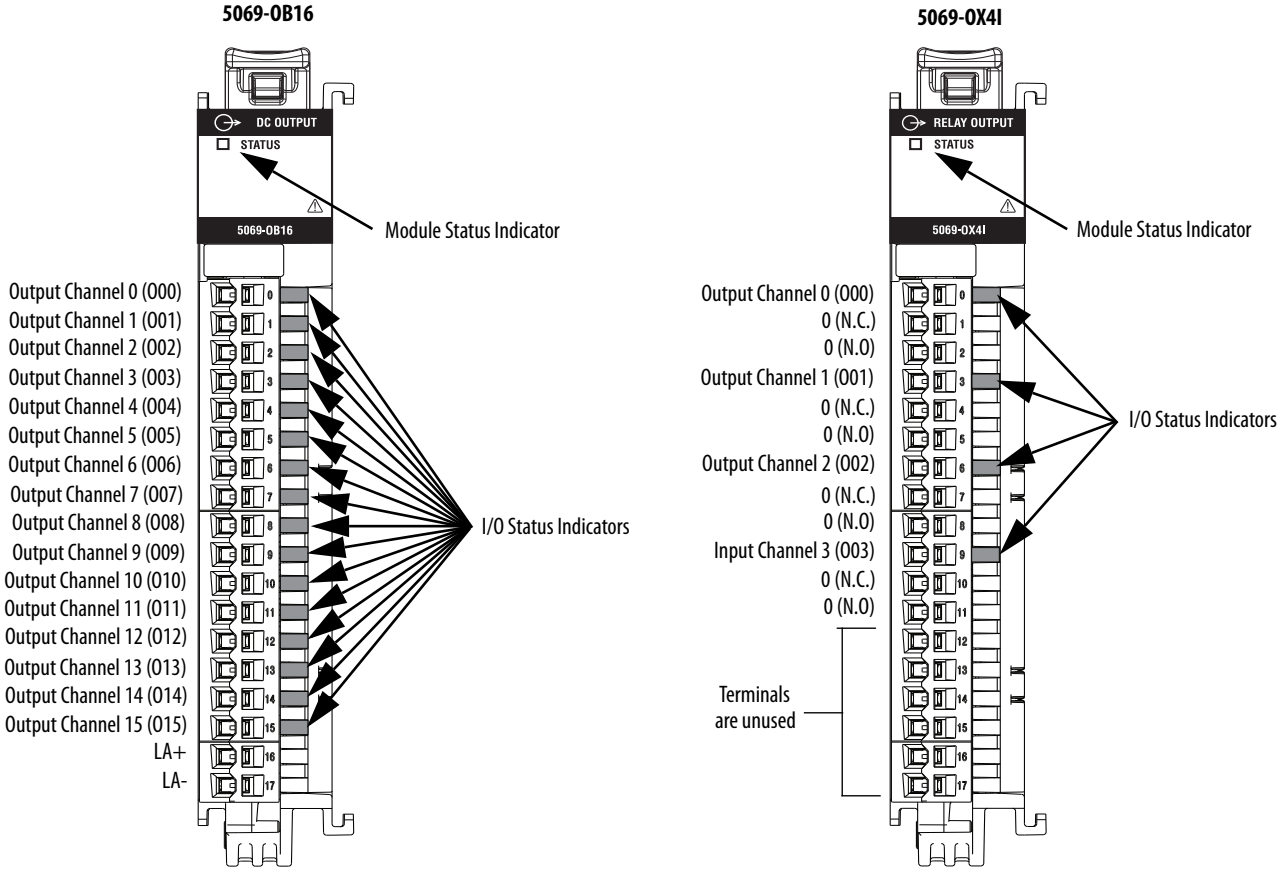
Table 15 - I/O Status Indicators for Input Modules

Indicator State	Description	Recommended Action
Off	Output is Off, or no module power applied	None
Yellow	The output is On.	None
Flashing red	There is an open wire, open load, overload, or short circuit.	Locate and correct the open circuit condition external to module.
Solid red	The module experienced a hardware fault.	Cycle module power. If the status indicator remains in the steady red state, replace the module.

5069 Compact I/O Digital Output Modules Status Indicators

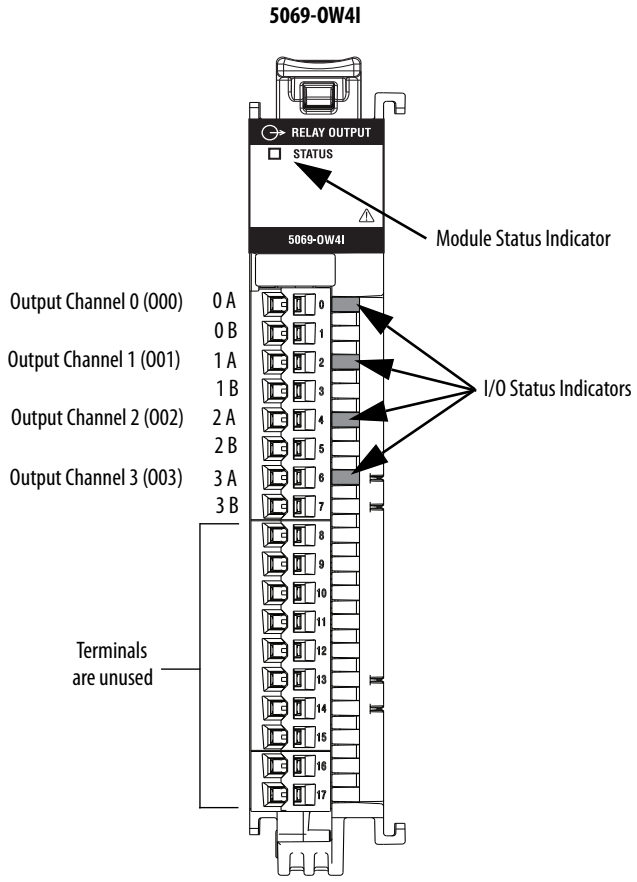
Figure 6 and Figure 7 show the status indicators on the 5069 Compact I/O digital output modules.

Figure 6 - 5069-OB16 and 5069-OX4I Digital Output Modules Status Indicators



IMPORTANT: The 5069-OB16F module status indicators appear the same as the indicators are shown on the 5069-OB16 module.

Figure 7 - 5069-OW4I Digital Output Module Status Indicators



5069 Compact I/O Digital Output Modules I/O Status Indicators

Table 16 describes the I/O Status indicators on 5069 Compact I/O digital output modules.

Table 16 - I/O Status Indicators for Output Modules

Indicator State(1)	Description	Recommended Action
Off	Output is Off, or no module power applied	None
Solid yellow	The output is On.	None
Yellow/red alternating	The output is On with an open circuit for maintenance.	None
Flashing red	An open circuit is detected. No load (Off state only)	Locate and correct open circuit condition.
Steady Red	The output has encountered a hardware fault or short circuit condition.	Check the output point at the controller.

(1) Not all digital output modules support all indicator states.

Use the Logix Designer Application for Troubleshooting

The Logix Designer application indicates the presence of fault conditions.

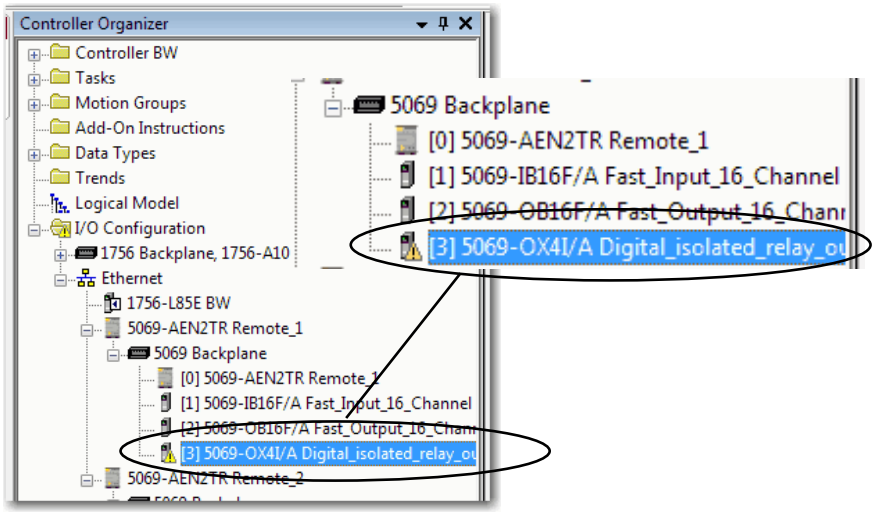
Fault conditions are reported in the following ways:

- Warning Signal in the I/O Configuration Tree
- Status and Fault Information in Module Properties Categories
- Logix Designer Application Tag Editor

Warning Signal in the I/O Configuration Tree

As shown in Figure 8, a warning icon appears in the I/O Configuration tree when a fault occurs.

Figure 8 - Warning Icon in Controller Organizer



Status and Fault Information in Module Properties Categories

The Module Properties section in the Logix Designer application includes a series of categories. The numbers and types of categories varies by module type.

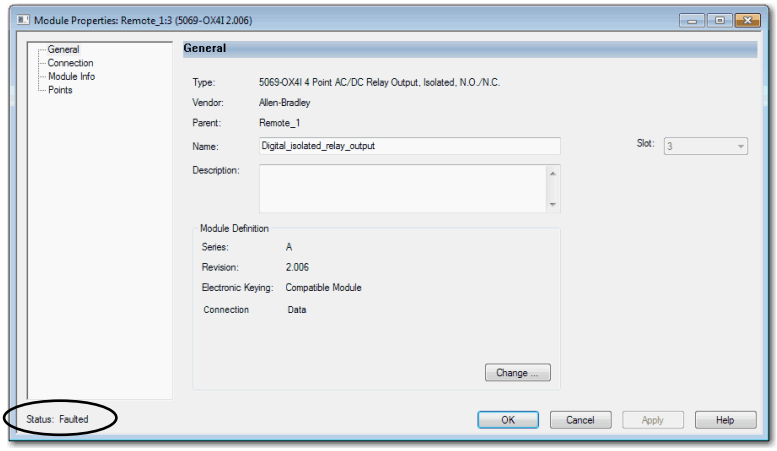
Each category includes options to configure the module or monitor the status of the module. The following are ways to monitor the state of a module for faults:

- Module Status on General Category
- Module Fault Descriptions on Connection Category
- Module Fault Descriptions on Module Info Category

Module Status on General Category

As shown in Figure 9, the status of a module is indicated on the General category of the Modules Properties.

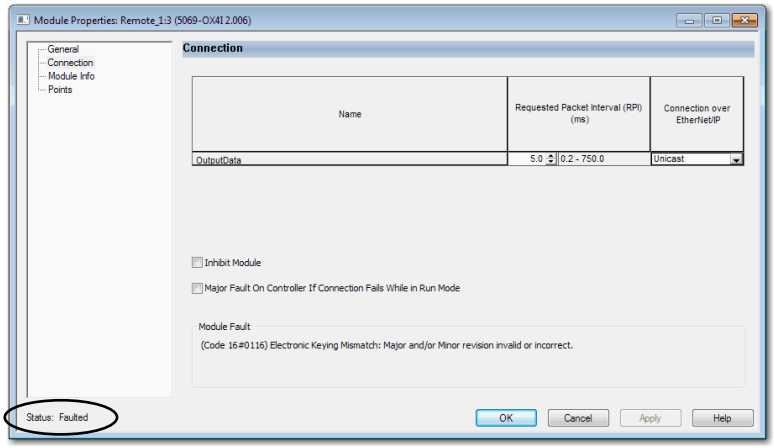
Figure 9 - Fault Message in Status Line



Module Fault Descriptions on Connection Category

As shown in Figure 10, a module fault description that includes an error code that is associated with the specific fault type is listed on the Connection category.

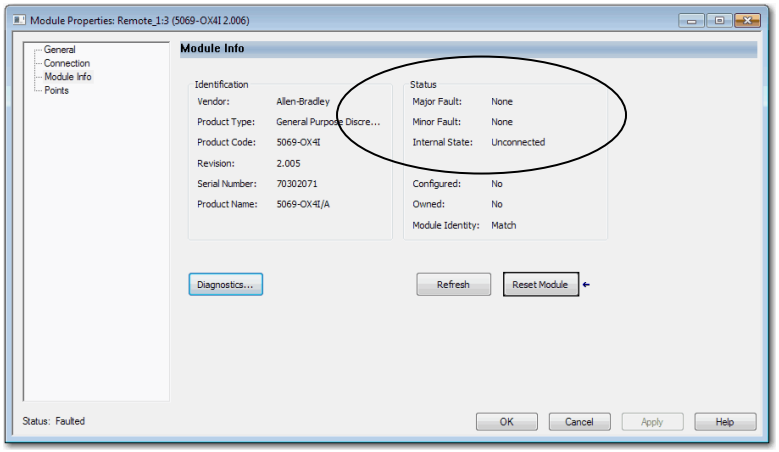
Figure 10 - Fault Description with Error Code



Module Fault Descriptions on Module Info Category

As shown in Figure 11, major and minor fault information is listed on the Module Info tab in the Status section.

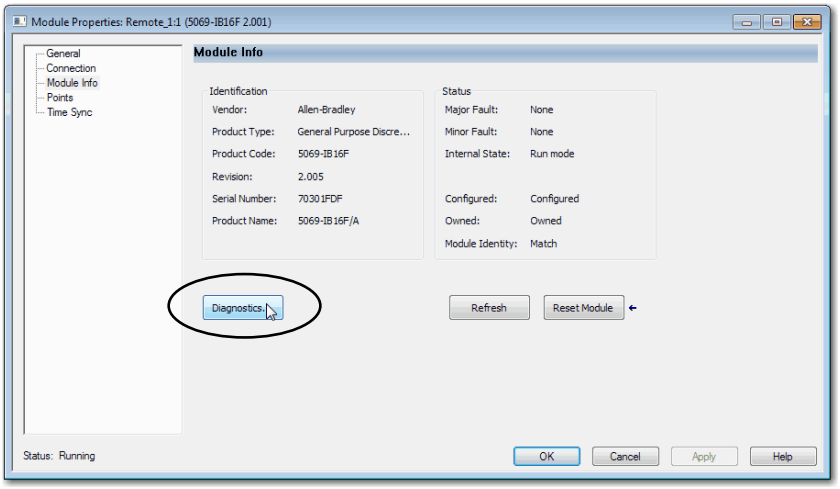
Figure 11 - Major and Minor Fault Information

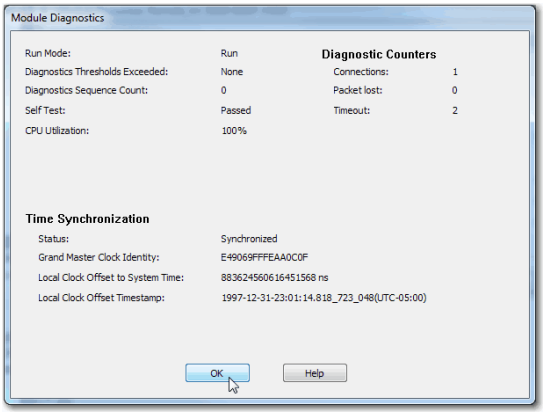


Module Diagnostics Dialog Box

Module Diagnostics are accessible from the Module Properties dialog box, as shown in Figure 12.

Figure 12 - Module Diagnostics

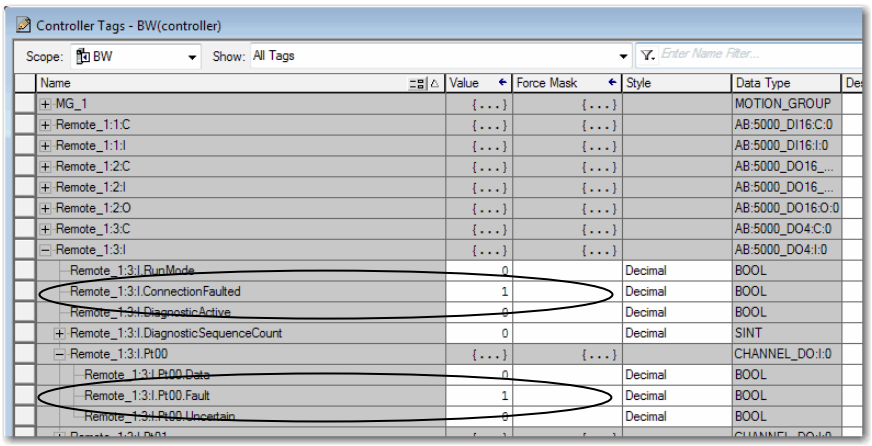




Logix Designer Application Tag Editor

Figure 13 show how fault conditions are indicated in the controller tags.

Figure 13 - Fault Indication in Controller Tags



Module Tag Definitions

Topic	Page
Tag Name Conventions	98
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Module tags are created when you add a module to the Logix Designer application project.

The set of tags that are associated with any module depends on the module type and the connection type. For example, if you use a Listen Only Connection in the Module Definition, the Logix Designer application creates only Input tags for that module.

There are four sets of tags for each module.

- Configuration
- Event Input - 5069-IB16F and 5069-IB6F-3W modules only
- Event Output - 5069-IB16F and 5069-IB6F-3W modules only
- Input
- Output

IMPORTANT The tables that are in this section list all tags available with a module. Not all tags in the list are used when that module type is added to a project. Tag use varies by module configuration.

Tag Name Conventions

The module tags use defined naming conventions. The conventions are as follows: (example tag name = ***remote_ethernet_adapter_1:I.Pt00.Data***).

The example module tag name is constructed as follows:

- remote_ethernet_adapter = name of the 5069-AEN2TR EtherNet/IP adapter in the 5069 Compact I/O™ system
- 1 = slot number
- I = tag type

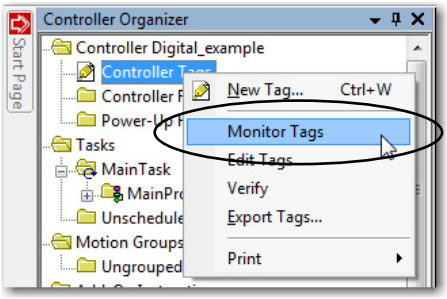
  The possible 5069 Compact I/O digital I/O tag types are C (configuration), EI (event input), EO (event output), I (input), O (output)
- Pt00 = module point number
- Data = tag function

  In this case, Data represents the input data that is returned to the owner-controller.

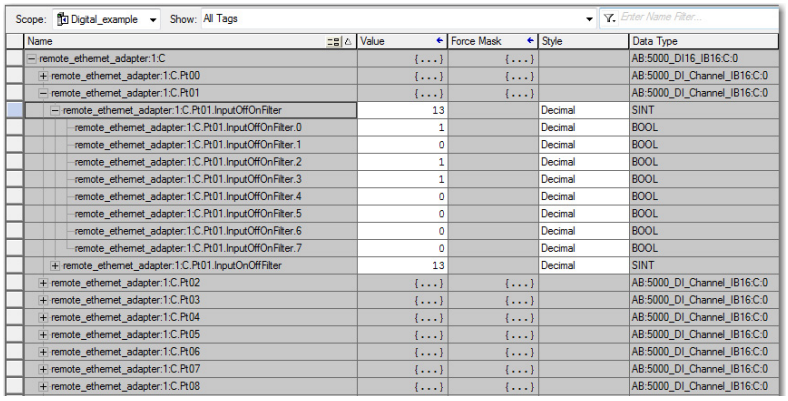
Access the Tags

You can view tags from the Tag Editor. Complete the following steps.

1. Open your Logix Designer application project.
2. Right-click Controller Tags and choose Monitor Tags.



3. Open the tags as necessary to view specific tags.



5069-IB16 Module Tags

This section describes the tags that are associated with the 5069-IB16 module.

Configuration Tags

Table 17 describes the 5069-IB16 module configuration tags.

Table 17 - 5069-IB16 Module Configuration Tags

Tag Name	Data Type	Definition	Valid Values
Counterxx.InputOffOnFilter	SINT	The amount of time that a signal must be in the on state before the input data indicates the on state. The amount of time is indicated using an enumeration. Not all products support all enumeration values.	9 = 0 µs 10 = 100 µs 11 = 200 µs 12 = 500 µs 13 = 1 ms 14 = 2 ms 15 = 5 ms 16 = 10 ms 17 = 20 ms 18 = 50 ms
Counterxx.InputOnOffFilter	SINT	The amount of time that a signal must be in the off state before the input data indicates the off state. The amount of time is indicated using an enumeration. Not all products support all enumeration values.	9 = 0 µs 10 = 100 µs 11 = 200 µs 12 = 500 µs 13 = 1 ms 14 = 2 ms 15 = 5 ms 16 = 10 ms 17 = 20 ms 18 = 50 ms
Counterxx.RolloverAtPreset	BIT	Determines whether the simple counter will rollover to 0 when it reaches 0:Preset (1) or at 2147483647 (0).	• 0 = Maximum value • 1 = Preset value
Ptxx.InputOffOnFilter	SINT	The amount of time that a signal must be in the on state before the input data indicates the on state. The amount of time is indicated using an enumeration. Not all products support all enumeration values.	9 = 0 µs 10 = 100 µs 11 = 200 µs 12 = 500 µs 13 = 1 ms 14 = 2 ms 15 = 5 ms 16 = 10 ms 17 = 20 ms 18 = 50 ms
Ptxx.InputOnOffFilter	SINT	The amount of time that a signal must be in the off state before the input data indicates the off state. The amount of time is indicated using an enumeration. Not all products support all enumeration values.	9 = 0 µs 10 = 100 µs 11 = 200 µs 12 = 500 µs 13 = 1 ms 14 = 2 ms 15 = 5 ms 16 = 10 ms 17 = 20 ms 18 = 50 ms

Input Tags

Table 18 describes the 5069-IB16 module input tags.

Table 18 - 5069-IB16 Module Input Tags

Tag Name	Data Type	Definition	Valid Values
RunMode	BIT	Channel's operating state	• 0 = Idle • 1 = Run
ConnectionFaulted	BIT	Indicates if a connection is running. The module sets this tag to 0 when connected. If the module is not connected, it changes the tag to 1.	• 0 = Connection running • 1 = Connection not running
DiagnosticActive	BIT	Indicates if any diagnostics are active or if the prognostics threshold is reached.	• 0 = No diagnostics active • 1 = One or more diagnostics are active or the prognostics threshold is reached
DiagnosticSequenceCount	SINT	Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected. Set to zero by product reset or power cycle. Wraps from 255 (-1) to 1 skipping zero.	-128…127 The value of 0 is skipped except during module power-up.
Counterxx.Count	DINT	The number of input transitions counted by a counter.	All values.
Counterxx.Data	BOOL	Indicates the current digital input value.	• 0 = On • 1 = Off
Counterxx.Done	BOOL	When set, indicates the corresponding counter Done bit (rising or falling depending on configuration) triggered the event.	• 0 = Corresponding Done bit did not trigger the event • 1 = Corresponding Done bit triggered the event
Counterxx.Fault	BOOL	Indicates that counter data is inaccurate and **cannot be trusted** for use in the application. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good • 1 = Bad, causing fault The typical causes of uncertain data are the following: – Wire Off condition – Underrange/Overrange condition – Short Circuit condition We recommend that you first troubleshoot the module to see if the typical causes exist.
Counterxx.Rollover	BIT	The counter counted up to Preset -1 and continued counting from or 0. The O:RolloverAck bit transitioning from 0 to 1 or the O:Reset transitioning from 0 to 1 clears this bit.	• 0 = Counter has not counted up to Preset - 1 and continued counting from 0 • 1 = Counter counted up to Preset - 1 and continued counting from 0
Counterxx.Uncertain	BIT	Indicates that the counter data can be inaccurate but the **degree of inaccuracy is not known**. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good data • 1 = Uncertain data The typical causes of uncertain data are the following: – Data signal slightly outside the channel operating range – Invalid sensor offset value – The last point data sample failed CRC while the most recent data sample was valid and used We recommend that you first troubleshoot the module to see if the typical causes exist.

Table 18 - 5069-IB16 Module Input Tags

Tag Name	Data Type	Definition	Valid Values
Ptxx.Data	BIT	Indicates the current digital input value.	• 0 = On • 1 = Off
Ptxx.Fault	BIT	Indicates that channel data is inaccurate and **cannot be trusted** for use in the application. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good • 1 = Bad, causing fault The typical causes of uncertain data are the following: – Wire Off condition – Underrange/Overrange condition – Short Circuit condition We recommend that you first troubleshoot the module to see if the typical causes exist.
Ptxx.Uncertain	BIT	Indicates that the channel data can be inaccurate but the **degree of inaccuracy is not known**. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good data • 1 = Uncertain data The typical causes of uncertain data are the following: – Data signal slightly outside the channel operating range – Invalid sensor offset value – The last point data sample failed CRC while the most recent data sample was valid and used We recommend that you first troubleshoot the module to see if the typical causes exist.

Output Tags

Table 19 describes the 5069-IB16 module output tags. The 5069-IB16 module output tags are only available if you have enabled counters in the Module Definition dialog box.

Table 19 - 5069-IB16 Module Output Tags

Tag Name	Data Type	Definition	Valid Values
Counterxx.Preset	DINT	If RolloverAtPreset is set, the counter counts to the Preset value and then rolls over to zero. If RolloverAtPreset is not set, the counter sets the Done bit and continues counting up to Max DINT. If C:RolloverAtPreset = 1, then if I:Count ≥ O:Preset, I:Count=0. I:Done bit always = 0. Set I:Rollover bit when I:Count transitions from O:Preset – 1 to 0. If C:RolloverAtPreset = 0, then if I:Count ≥ O:Preset, I:Done = 1, else I:Done = 0 Set I:Rollover bit when I:Count transitions from 2,147,483,647 to 0.	0…2,147,483,647
Counterxx.Reset	BIT	When this bit transitions from 0 to 1 I:Count and I:Rollover are set to zero.	• 0 = I:Count and I:Rollover values are not set to 0 • 1 = I:Count and I:Rolloever values are set to 0
Counterxx.RolloverAck	BIT	Clears the Rollover bit in the input tag when it transitions from 0 to 1.	• 0 = I:Rollover bit is not cleared • 1 = I:Rollover bit is cleared

5069-IB16F Module Tags

This section describes the tags that are associated with the 5069-IB16F module.

Configuration Tags

Table 20 describes the 5069-IB16F module configuration tags.

Table 20 - 5069-IB16F Module Configuration Tags

Tag Name	Size	Definition	Valid Values
Counterxx.InputOffOnFilter	SINT	The amount of time that a signal must be in the on state before the input data indicates the on state. The amount of time is indicated using an enumeration. Not all products support all enumeration values.	5 = 0 µs 6 = 5 µs 7 = 10 µs 8 = 20 µs 9 = 50 µs 10 = 100 µs 11 = 200 µs 12 = 500 µs 13 = 1 ms 14 = 2 ms 15 = 5 ms 16 = 10 ms 17 = 20 ms 18 = 50 ms
Counterxx.InputOnOffFilter	SINT	The amount of time that a signal must be in the off state before the input data indicates the off state. The amount of time is indicated using an enumeration. Not all products support all enumeration values.	5 = 0 µs 6 = 5 µs 7 = 10 µs 8 = 20 µs 9 = 50 µs 10 = 100 µs 11 = 200 µs 12 = 500 µs 13 = 1 ms 14 = 2 ms 15 = 5 ms 16 = 10 ms 17 = 20 ms 18 = 50 ms
Counterxx.RolloverAtPreset	BIT	Determines whether the simple counter will rollover to 0 when it reaches 0:Preset (1) or at 2147483647 (0).	• 0 = Maximum value • 1 = Preset value
Ptxx.CaptureOffOnEn	BIT	Enables capturing Off to On time stamps. If cleared, the point does not record Off to On time stamps.	• 0 = Capture disabled for OFF to ON input transitions • 1 = Capture enabled (default) for OFF to ON input transitions
Ptxx.CaptureOnOffEn	BIT	Enables capturing On to Off time stamps. If cleared, the point does not record On to Off time stamps.	• 0 = Capture disabled for ON to OFF input transitions • 1 = Capture enabled (default) for ON to OFF input transitions
Ptxx.ChatterCount	SINT	The number of input changes that are considered Chatter.	• 0 = Disabled • 2…127 = Enabled
Ptxx.ChatterTime	INT	A value from 1…10000 ms in whole ms increments.	1…10000

Table 20 - 5069-IB16F Module Configuration Tags

Tag Name	Size	Definition	Valid Values
Ptxx.InputOffOnFilter	SINT	The amount of time that a signal must be in the on state before the input data indicates the on state. The amount of time is indicated using an enumeration. Not all products support all enumeration values.	5 = 0 µs 6 = 5 µs 7 = 10 µs 8 = 20 µs 9 = 50 µs 10 = 100 µs 11 = 200 µs 12 = 500 µs 13 = 1 ms 14 = 2 ms 15 = 5 ms 16 = 10 ms 17 = 20 ms 18 = 50 ms
Ptxx.InputOnOffFilter	SINT	The amount of time that a signal must be in the off state before the input data indicates the off state. The amount of time is indicated using an enumeration. Not all products support all enumeration values.	5 = 0 µs 6 = 5 µs 7 = 10 µs 8 = 20 µs 9 = 50 µs 10 = 100 µs 11 = 200 µs 12 = 500 µs 13 = 1 ms 14 = 2 ms 15 = 5 ms 16 = 10 ms 17 = 20 ms 18 = 50 ms
Ptxx.TimestampLatchEn	BIT	When this bit is set, timestamps are latched; this means that a Timestamp is not overwritten until acknowledged. All subsequent transitions on that point are ignored until acknowledged/reset. If the bit is not set, the new LO Timestamp overwrites the first LO Timestamp immediately, even if the controller has yet to extract that data.	• 0 = Timestamps are overridden with each successive COS transition. • 1 = Timestamps are latched until acknowledged.

Event Input Tags

Table 21 describes the 5069-IB16F module event input tags. The event input tags are displayed only if Data with Events is selected in the Module Definition window.

Table 21 - 5069-IB16F Module Event Input Tags

Tag Name	Size	Definition	Valid Values
ConnectionFaulted	BIT	Indicates if a connection is running. The module sets this tag to 0 when connected. If the module is not connected, it changes the tag to 1.	• 0 = Connection running • 1 = Connection not running
Diagnostic Active	BIT	Indicates if any diagnostics are active or if the prognostics threshold is reached.	• 0 = No diagnostics active • 1 = One or more diagnostics are active or the prognostics threshold is reached
DiagnosticSequence Count	SINT	Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected. Set to zero by product reset or power cycle. Wraps from 255 (-1) to 1 skipping zero.	-128…127 The value of 0 is skipped except during module power-up.
Eventx	BOOL	Indicates the number of the event.	0…3
Eventx.CIPSyncTimeout	BIT	Indicates that the module was once synced with a 1588 master, but is not now due to a timeout.	• 0 = A valid time master has not timed out. • 1 = A valid time master was detected on the backplane, but the time master has timed out. The module is using its local clock and can be drifting away from the last known time master.
Eventx.CIPSyncValid	BIT	Indicates whether the module is synced with a 1588 master.	• 0 = CIP Sync is not available • 1 = CIP Sync is available
Eventx.CounterxxDone	BIT	When set, indicates the corresponding counter Done bit (rising or falling depending on configuration) triggered the event.	• 0 = Corresponding counter Done bit did not trigger the event • 1 = Corresponding counter Done bit triggered the event
Eventx.CounterxxFault	BIT	When set, indicates that the corresponding counter had a fault indicated when the event occurred.	• 0 = Corresponding counter did not have a fault indicated when the event occurred • 1 = Corresponding counter did have a fault indicated when the event occurred
Eventx.EventDropped	BIT	Indicates when an event has been discarded because events are occurring faster than they are being acknowledged.	• 0 = An event status has not been dropped. • 1 = An event status has been dropped.
Eventx.EventFalling	BIT	Indicates whether an event triggered when an input transition resulted in an event pattern no longer being matched.	0 or 1
Eventx.EventNumber	DINT	Running count of events, which increments by one each new time event. The originator sets the Event Number Ack to the Event Number to acknowledge receipt of the event. When the EventNumber reaches it maximum value and rolls over it is to roll over to 1, not 0.	All values.
Eventx.EventRising	BIT	Indicates whether an event triggered when an input transition results in an event pattern being matched.	0 or 1
Eventx.EventsPending	SINT	The number of events currently queued in the modules. A value greater than 0 indicates that the controller is not currently keeping up with the rate of events.	All positive values.
Eventx.EventTimestamp	LINT	The time the event occurred.	All positive values.
Eventx.Fault	BIT	Detects whether the signal is good data. The fault is set to 1 by the originator when the connection is lost.	• 0 = Good • 1 = Bad

Table 21 - 5069-IB16F Module Event Input Tags

Tag Name	Size	Definition	Valid Values
Eventx.PtxxData	BIT	When set, indicates the corresponding data value (rising or falling depending on configuration) triggered the event.	• 0 = Corresponding data value did not trigger the event • 1 = Corresponding data value triggered the event
Eventx.PtxxFault	BIT	Indicates that channel data is inaccurate and **cannot be trusted** for use in the application. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good • 1 = Bad, causing fault The typical causes of uncertain data are the following: – Wire Off condition – Underrange/Overrange condition – Short Circuit condition We recommend that you first troubleshoot the module to see if the typical causes exist.
Eventx.Uncertain	BIT	Indicates that the channel data can be inaccurate but the **degree of inaccuracy is not known**. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good data • 1 = Uncertain data The typical causes of uncertain data are the following: – Data signal slightly outside the channel operating range – Invalid sensor offset value – The last point data sample failed CRC while the most recent data sample was valid and used We recommend that you first troubleshoot the module to see if the typical causes exist.
RunMode	BIT	Channel's operating state	• 0 = Idle • 1 = Run Mode

Event Output Tags

Table 22 describes the 5069-IB16F module event output tags. The event output tags are displayed only if Data with Events is selected in the Module Definition window.

Table 22 - 5069-IB16F Module Event Output Tags

Tag Name	Size	Definition	Valid Values
Eventxx.CounterxxSelect	BIT	When set, indicates that the corresponding counter is to participate in the event trigger definition.	0 = Corresponding counter does not participate in the event trigger definition 1= Corresponding counter participates in the event trigger definition
Eventxx.CounterxxValue	BIT	If the counter function is selected in the event trigger definition, this member indicates that value that is to trigger the event.	0 or 1
Eventxx.En	BIT	When set, the corresponding event trigger definition is active and events are triggered when conditions match the definition.	0 = Event trigger definition is not active and events are not triggered when conditions match the definition 1 = Event trigger definition is active and events are triggered when conditions match the definition
Eventxx.EventFallingEn	BIT	When set an event is to trigger each time a condition change results in conditions that no longer match the event trigger definition.	0 or 1

Table 22 - 5069-IB16F Module Event Output Tags

Tag Name	Size	Definition	Valid Values
Eventxx.EventNumberAck	DINT	The controller writes back the EI:Event[<n>].EventNumber into this EO:Event[<n>].EventNumberAck to indicate receipt of the event. All events with I:EventNumbers that occurred before EventNumberAck is acknowledged.	All values
Eventxx.EventRisingEn	BIT	When set an event is to trigger each time a condition change results in conditions that match the event trigger definition.	0 or 1
Eventxx.IndependentConditionTriggerEn	BIT	For events, determines whether each condition that is indicated in the trigger definition can initiate an event independently.	• 0 = When all selected conditions achieve the configured values, an event is triggered. • 1 = When any selected condition achieves the configured value, an event is triggered.
Eventxx.LatchEn	BIT	When set, events are latched until acknowledged. A new event is lost if the previous event has not been acknowledged. When not set, new events overwrite old events.	• 0 = Not latched (default) • 1 = Latched
Eventxx.PtxxDataSelect	BIT	When set, indicates that the corresponding data value is to participate in the event trigger definition.	0 or 1
Eventxx.PtxxDataValue	BOOL	Indicates the input value of the event point data.	• 0 = Input inactive • 1 = Input active
Eventxx.ResetEvent	BIT	When transitions from 0 to 1, resets all events and clears the event queue on the channel.	• 0 = Events are not cleared. • 1 = Events are cleared when a rising edge occurs.

Input Tags

Table 23 describes the 5069-IB16F module input tags.

Table 23 - 5069-IB16F Module Input Tags

Tag Name	Size	Definition	Valid Values
CIPSyncTimeout	BIT	Indicates that the module was once synced with a 1588 master, but is not now due to a timeout.	• 0 = A valid time master has not timed out. • 1 = A valid time master was detected on the backplane, but the time master has timed out. The module is using its local clock and can be drifting away from the last known time master.
CIPSyncValid	BIT	Indicates whether the module is synced with a 1588 master.	• 0 = CIP Sync is not available • 1 = CIP Sync is available
ConnectionFaulted	BIT	Indicates if a connection is running. The module sets this tag to 0 when connected. If the module is not connected, it changes the tag to 1.	• 0 = Connection running • 1 = Connection not running
Counterxx.Count	DINT	The number of input transitions counted by a counter.	All values
Counterxx.Data	BIT	Current digital output data to be applied for normal (unscheduled) outputs.	• 0 = Off • 1 = On
Counterxx.Done	BIT	Indicates that the I:Count ≥ O:Preset.G430.	0 or 1

Table 23 - 5069-IB16F Module Input Tags

Tag Name	Size	Definition	Valid Values
Counterxx.Fault	BIT	Indicates that counter data is inaccurate and **cannot be trusted** for use in the application. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good • 1 = Bad, causing fault The typical causes of uncertain data are the following: – Wire Off condition – Underrange/Overrange condition – Short Circuit condition We recommend that you first troubleshoot the module to see if the typical causes exist.
Counterxx.Rollover	BIT	The counter counted up to RolloverValue - 1 (for HSC) or Preset -1 (for simple counters) and then continued counting from the O:Rollunder (for HSC) or 0 (for simple counters). The O:RolloverAck bit transitioning from 0 to 1 or the O:Reset transitioning from 0 to 1 clears this bit.	0 or 1
Counterxx.Uncertain	BIT	Indicates that the channel data can be inaccurate but the **degree of inaccuracy is not known**. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good data • 1 = Uncertain data The typical causes of uncertain data are the following: – Data signal slightly outside the channel operating range – Invalid sensor offset value – The last point data sample failed CRC while the most recent data sample was valid and used We recommend that you first troubleshoot the module to see if the typical causes exist.
Diagnostic Active	BIT	Indicates if any diagnostics are active or if the prognostics threshold is reached.	• 0 = No diagnostics active • 1 = One or more diagnostics are active or the prognostics threshold is reached
DiagnosticSequence Count	SINT	Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected. Set to zero by product reset or power cycle. Wraps from 255 (-1) to 1 skipping zero.	-128…127 The value of 0 is skipped except during module power-up.
EventStatusx.CIPSyncTimeout	BIT	Indicates that the module was once synced with a 1588 master, but is not now due to a timeout.	• 0 = A valid time master has not timed out. • 1 = A valid time master was detected on the backplane, but the time master has timed out. The module is using its local clock and can be drifting away from the last known time master.
EventStatusx.CIPSyncValid	BIT	Indicates whether the module is synced with a 1588 master.	• 0 = CIP Sync is not available • 1 = CIP Sync is available
EventStatusx.EventDropped	BIT	Indicates when an event has been discarded because events are occurring faster than they are being acknowledged.	• 0 = An event status has not been dropped. • 1 = An event status has been dropped.
EventStatusx.EventNumber	DINT	Running count of events, which increments by one each new time event. The originator sets the Event Number Ack to the Event Number to acknowledge receipt of the event. When the EventNumber reaches it maximum value and rolls over it is to roll over to 1, not 0.	All values.
EventStatusx.EventReset	BIT	When EO.Event[<n>].ResetEvent transitions from 0 to 1, I.EventStatus[<n>].EventReset transitions to 1 to indicate that the reset was received and completed. It stays 1 until EO.Event[<n>].ResetEvent transition to zero.	• 0 = Do not reset • 1 = Reset
EventStatusx.EventsPending	SINT	The number of events currently queued in the modules. A value greater than zero indicates that the controller is not currently keeping up with the rate of events.	All positive values.

Table 23 - 5069-IB16F Module Input Tags

Tag Name	Size	Definition	Valid Values
Ptxx.Chatter	BIT	Indicates if the input is chattering per the ChatterTime and ChatterCount settings.	• 0 = Normal • 1 = Input is chattering
Ptxx.CIPSyncTimeout	BIT	Indicates that the module was once synced with a 1588 master, but is not now due to a timeout.	• 0 = A valid time master has not timed out. • 1 = A valid time master was detected on the backplane, but the time master has timed out. The module is using its local clock and can be drifting away from the last known time master.
Ptxx.CIPSyncValid	BIT	Indicates whether the module is synced with a 1588 master.	• 0 = CIP Sync is not available • 1 = CIP Sync is available
PtxxData	BIT	When set, indicates the corresponding data value (rising or falling depending on configuration) triggered the event.	0 or 1
PtxxFault	BIT	Indicates that channel data is inaccurate and **cannot be trusted** for use in the application. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good • 1 = Bad, causing fault The typical causes of uncertain data are the following: – Wire Off condition – Underrange/Overrange condition – Short Circuit condition We recommend that you first troubleshoot the module to see if the typical causes exist.
Ptxx.TimestampOffOn	LINT	64 bit Timestamp corresponding to when a change of state Off to On was recorded at the input.	All values.
Ptxx.TimestampOffOnNumber	INT	64 bit Timestamp corresponding to when a change of state Off to On was recorded at the input.	All values.
Ptxx.TimestampOnOff	LINT	64 bit Timestamp corresponding to when a change of state On to Off was recorded at the input.	All values.
Ptxx.TimestampOnOffNumber	INT	64 bit Timestamp corresponding to when a change of state On to Off was recorded at the input.	All values.
Ptxx.TimestampOverflowOffOn	BIT	Indicates an Off to On time stamp was lost in a discrete product. If TimestampLatchEn is set then a new time stamp was not recorded because one is already latched. If TimestampLatchEn is clear a timestamp was overwritten.	0 or 1
Ptxx.TimestampOverflowOnOff	BIT	Indicates an On to Off time stamp was lost in a discrete product. If TimestampLatchEn is set then a new time stamp was not recorded because one is already latched. If TimestampLatchEn is clear a timestamp was overwritten.	0 or 1
Ptxx.Uncertain	BIT	Indicates that the channel data can be inaccurate but the **degree of inaccuracy is not known**. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good data • 1 = Uncertain data The typical causes of uncertain data are the following: – Data signal slightly outside the channel operating range – Invalid sensor offset value – The last point data sample failed CRC while the most recent data sample was valid and used We recommend that you first troubleshoot the module to see if the typical causes exist.
RunMode	BIT	Channel's operating state	• 0 = Idle • 1 = Run Mode
Uncertain	BIT	Indicates if the module is operating outside is designed operating range of if data is under manual or override control.	• 0 = Good • 1 = Uncertain

Output Tags

Table 24 describes the 5069-IB16F module output tags.

Table 24 - 5069-IB16F Module Output Tags

Tag Name	Size	Definition	Valid Values
Counterxx.Preset	DINT	If RolloverAtPreset is set, the counter counts to the Preset value and then rolls over to zero. If RolloverAtPreset is not set, the counter sets the Done bit and continues counting up to Max DINT. If C:RolloverAtPreset = 1, then if I:Count ≥ O:Preset, I:Count=0. I:Done bit always = 0. Set I:Rollover bit when I:Count transitions from O:Preset – 1 to 0. If C:RolloverAtPreset = 0, then if I:Count ≥ O:Preset, I:Done = 1, else I:Done = 0 Set I:Rollover bit when I:Count transitions from 2,147,483,647 to 0.	0…2,147,483,647
Counterxx.Reset	BIT	When this bit transitions from 0 to 1, I:Count, and I:Rollover are set to zero.	• 0 = Do not reset • 1 = Reset
Counterxx.RolloverAck	BIT	Clears the Rollunder tag in the input tag when it transitions from 0 to 1.	0 or 1
Ptxx.ResetTimestamps	BIT	Erases all recorded timestamps for the input channel when it transitions from 0 to 1.	• 0 = Timestamps are not erased. • 1 = Timestamps are erased.
Ptxx.TimestampOffOnNumberAck	INT	An Off to On timestamp identifier that is written by the controller to indicate that the identified timestamp has been seen and acted on. When Latching is enabled and the Timestamp Number that is received from the controller matches the most recent timestamp that is produced, the module is then allowed to produce a new timestamp.	All values.
Ptxx.TimestampOnOffNumberAck	INT	An On to Off timestamp identifier that is written by the controller to indicate that the identified timestamp has been seen and acted on. When Latching is enabled and the Timestamp Number that is received from the controller matches the most recent timestamp that is produced, the module is then allowed to produce a new timestamp.	All values.

5069-IB6F-3W Module Tags

This section describes the tags that are associated with the 5069-IB6F-3W module.

Configuration Tags

Table 25 describes the 5069-IF6F-3W module configuration tags.

Table 25 - 5069-IB6F-3W Configuration Tags

Tag Name	Size	Definition	Valid Values
Counterxx.InputOffOnFilter	SINT	The amount of time that a signal must be in the on state before the input data indicates the on state. The amount of time is indicated using an enumeration. Not all products support all enumeration values.	5 = 0 µs 6 = 5 µs 7 = 10 µs 8 = 20 µs 9 = 50 µs 10 = 100 µs 11 = 200 µs 12 = 500 µs 13 = 1 ms 14 = 2 ms 15 = 5 ms 16 = 10 ms 17 = 20 ms 18 = 50 ms
Counterxx.InputOnOffFilter	SINT	The amount of time that a signal must be in the off state before the input data indicates the off state. The amount of time is indicated using an enumeration. Not all products support all enumeration values.	5 = 0 µs 6 = 5 µs 7 = 10 µs 8 = 20 µs 9 = 50 µs 10 = 100 µs 11 = 200 µs 12 = 500 µs 13 = 1 ms 14 = 2 ms 15 = 5 ms 16 = 10 ms 17 = 20 ms 18 = 50 ms
Counterxx.RolloverAtPreset	BIT	Determines whether the simple counter will rollover to 0 when it reaches 0:Preset (1) or at 2147483647 (0).	• 0 = Maximum value • 1 = Preset value
Ptxx.CaptureOffOnEn	BIT	Enables capturing Off to On time stamps. If cleared, point does not record Off to On time stamps.	• 0 = Capture disabled for OFF to ON input transitions • 1 = Capture enabled (default) for OFF to ON input transitions
Ptxx.CaptureOnOffEn	BIT	Enables capturing On to Off time stamps. If cleared, point does not record On to Off time stamps.	• 0 = Capture disabled for ON to OFF input transitions • 1 = Capture enabled (default) for ON to OFF input transitions
Ptxx.ChatterCount	SINT	The number of input changes that are considered Chatter.	• 0 = Disabled • 2…127 = Enabled
Ptxx.ChatterTime	INT	A value from 1…10000 ms in whole ms increments.	1…10000

Table 25 - 5069-IB6F-3W Configuration Tags

Tag Name	Size	Definition	Valid Values
Ptxx.InputOffOnFilter	SINT	The amount of time that a signal must be in the on state before the input data indicates the on state. The amount of time is indicated using an enumeration. Not all products support all enumeration values.	5 = 0 µs 6 = 5 µs 7 = 10 µs 8 = 20 µs 9 = 50 µs 10 = 100 µs 11 = 200 µs 12 = 500 µs 13 = 1 ms 14 = 2 ms 15 = 5 ms 16 = 10 ms 17 = 20 ms 18 = 50 ms
Ptxx.InputOnOffFilter	SINT	The amount of time that a signal must be in the off state before the input data indicates the off state. The amount of time is indicated using an enumeration. Not all products support all enumeration values.	5 = 0 µs 6 = 5 µs 7 = 10 µs 8 = 20 µs 9 = 50 µs 10 = 100 µs 11 = 200 µs 12 = 500 µs 13 = 1 ms 14 = 2 ms 15 = 5 ms 16 = 10 ms 17 = 20 ms 18 = 50 ms
Ptxx.TimestampLatchEn	BIT	When this bit is set, timestamps are latched; this means that a Timestamp is not overwritten until acknowledged. All subsequent transitions on that point are ignored until acknowledged/reset. If the bit is not set, the new LO Timestamp overwrites the first LO Timestamp immediately, even if the controller has yet to extract that data.	• 0 = Timestamps are overridden with each successive COS transition. • 1 = Timestamps are latched until acknowledged.

Event Input Tags

Table 26 describes the 5069-IB6F-3W module event input tags. The event input tags are displayed only if you select Data with Events in the Module Definition window.

Table 26 - 5069-IB6F-3W Module Event Input Tags

Tag Name	Size	Definition	Valid Values
ConnectionFaulted	BIT	Indicates if a connection is running. The module sets this tag to 0 when connected. If the module is not connected, it changes the tag to 1.	• 0 = Connection running • 1 = Connection not running
DiagnosticActive	BIT	Indicates if any diagnostics are active or if the prognostics threshold is reached.	• 0 = No diagnostics active • 1 = One or more diagnostics are active or the prognostics threshold is reached
DiagnosticSequenceCount	SINT	Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected. Set to zero by product reset or power cycle. Wraps from 255 (-1) to 1 skipping zero.	-128…127 The value of 0 is skipped except during module power-up.
Eventx	BOOL	Indicates the number of the event.	0…3
Eventx.CIPSyncTimeout	BIT	Indicates that the module was once synced with a 1588 master, but is not now due to a timeout.	• 0 = A valid time master has not timed out. • 1 = A valid time master was detected on the backplane, but the time master has timed out. The module is using its local clock and can be drifting away from the last known time master.
Eventx.CIPSyncValid	BIT	Indicates whether the module is synced with a 1588 master.	• 0 = CIP Sync is not available • 1 = CIP Sync is available
Eventx.CounterxxDone	BIT	When set, indicates the corresponding counter Done bit (rising or falling depending on configuration) triggered the event.	0 or 1
Eventx.CounterxxFault	BIT	When set, indicates that the corresponding counter had a fault indicated when the event occurred.	0 or 1
Eventx.EventDropped	BIT	Indicates when an event has been discarded because events are occurring faster than they are being acknowledged.	• 0 = An event status has not been dropped. • 1 = An event status has been dropped.
Eventx.EventFalling	BIT	Indicates whether an event triggered when an input transition resulted in an event pattern no longer being matched.	0 or 1
Eventx.EventNumber	DINT	Running count of events, which increments by one each new time event. The originator sets the Event Number Ack to the Event Number to acknowledge receipt of the event. When the EventNumber reaches it maximum value and rolls over it is to roll over to 1, not 0.	All values.
Eventx.EventRising	BIT	Indicates whether an event triggered when an input transition results in an event pattern being matched.	0 or 1
Eventx.EventsPending	SINT	The number of events currently queued in the modules. A value greater than 0 indicates that the controller is not currently keeping up with the rate of events.	All positive values.
Eventx.Fault	BIT	Detects whether the signal is good data. The fault is set to 1 by the originator when the connection is lost.	• 0 = Good • 1 = Bad
Eventx.PtxxData	BIT	When set, indicates the corresponding data value (rising or falling depending on configuration) triggered the event.	0 or 1

Table 26 - 5069-IB6F-3W Module Event Input Tags

Tag Name	Size	Definition	Valid Values
Eventx.PtxxFault	BIT	Indicates that channel data is inaccurate and **cannot be trusted** for use in the application. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good • 1 = Bad, causing fault The typical causes of uncertain data are the following: – Wire Off condition – Underrange/Overrange condition – Short Circuit condition We recommend that you first troubleshoot the module to see if the typical causes exist.
Eventx.Timestamp	LINT	The time the event occurred.	All positive values.
Eventx.Uncertain	BIT	Indicates that the channel data can be inaccurate but the **degree of inaccuracy is not known**. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good data • 1 = Uncertain data The typical causes of uncertain data are the following: – Data signal slightly outside the channel operating range – Invalid sensor offset value – The last point data sample failed CRC while the most recent data sample was valid and used We recommend that you first troubleshoot the module to see if the typical causes exist.
RunMode	BIT	Channel's operating state	• 0 = Idle • 1 = Run Mode

Event Output Tags

Table 27 describes the 5069-IB6F-3W module event output tags. The event output tags are displayed only if you select Data with Events in the Module Definition window.

Table 27 - 5069-IB6F-3W Module Event Output Tags

Tag Name	Size	Definition	Valid Values
Eventxx.CounterxxSelect	BIT	When set, indicates that the corresponding counter is to participate in the event trigger definition.	0 or 1
Eventxx.CounterxxValue	BIT	If the counter function is selected in the event trigger definition, this member indicates that value that is to trigger the event.	0 or 1
Eventxx.En	BIT	When set the corresponding event trigger definition is active and events are triggered when conditions match the definition.	0 or 1
Eventxx.EventFallingEn	BIT	When set an event is to trigger each time a condition change results in conditions that no longer match the event trigger definition.	0 or 1
Eventxx.EventNumberAck	DINT	The controller writes back the EI:Event[<n>].EventNumber into this EO:Event[<n>].EventNumberAck to indicate receipt of the event. All events with I:EventNumbers that occurred before EventNumberAck is acknowledged.	All values.
Eventxx.EventRisingEn	BIT	When set an event is to trigger each time a condition change results in conditions that match the event trigger definition.	0 or 1

Table 27 - 5069-IB6F-3W Module Event Output Tags

Tag Name	Size	Definition	Valid Values
Eventxx.IndependentConditionTriggerEn	BIT	For events, determines whether each condition that is indicated in the trigger definition can initiate an event independently.	• 0 = When all selected conditions achieve the configured values, an event is triggered. • 1 = When any selected condition achieves the configured value, an event is triggered.
Eventxx.LatchEn	BIT	When set, events are latched until acknowledged. A new event is lost if the previous event has not been acknowledged. When not set, new events overwrite old events.	• 0 = Not latched (default) • 1 = Latched
Eventxx.PtxxDataSelect	BIT	When set, indicates that the corresponding data value is to participate in the event trigger definition.	0 or 1
Eventxx.PtxxDataValue	BOOL	Input value of the event point data.	• 0 = Input inactive • 1 = Input active
Eventxx.ResetEvent	BIT	When the value transitions from 0 to 1, resets all events and clears the event queue on the channel.	• 0 = Events are not cleared • 1 = Events are cleared when a rising edge occurs

Input Tags

Table 28 describes the 5069-IB6F-3W module input tags.

Table 28 - 5069-IB6F-3W Module Input Tags

Tag Name	Size	Definition	Valid Values
CIPSyncTimeout	BIT	Indicates that the module was once synced with a 1588 master, but is not now due to a timeout.	• 0 = A valid time master has not timed out. • 1 = A valid time master was detected on the backplane, but the time master has timed out. The module is using its local clock and can be drifting away from the last known time master.
CIPSyncValid	BIT	Indicates whether the module is synced with a 1588 master.	• 0 = CIP Sync is not available • 1 = CIP Sync is available
ConnectionFaulted	BIT	Indicates if a connection is running. The module sets this tag to 0 when connected. If the module is not connected, it changes the tag to 1.	• 0 = Connection running • 1 = Connection not running
Counterxx.Count	DINT	The number of input transitions counted by a counter.	All values.
Counterxx.Data	BIT	Indicates the current digital input value.	• 0 = On • 1 = Off
Counterxx.Done	BIT	Indicates that the I:Count ≥ O:Preset.G430.	0 or 1
Counterxx.Fault	BIT	Indicates that channel data is inaccurate and **cannot be trusted** for use in the application. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good • 1 = Bad, causing fault The typical causes of uncertain data are the following: – Wire Off condition – Underrange/Overrange condition – Short Circuit condition We recommend that you first troubleshoot the module to see if the typical causes exist.
Counterxx.Rollover	BIT	The counter counted up to RolloverValue - 1 (for HSC) or Preset -1 (for simple counters) and then continued counting from the O:Rollunder (for HSC) or 0 (for simple counters). The O:RolloverAck bit transitioning from 0 to 1 or the O:Reset transitioning from 0 to 1 clears the bit.	0 or 1

Table 28 - 5069-IB6F-3W Module Input Tags

Tag Name	Size	Definition	Valid Values
Counterxx.Uncertain	BIT	Indicates that the counter data can be inaccurate but the **degree of inaccuracy is not known**. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good data • 1 = Uncertain data The typical causes of uncertain data are the following: – Data signal slightly outside the channel operating range – Invalid sensor offset value – The last point data sample failed CRC while the most recent data sample was valid and used We recommend that you first troubleshoot the module to see if the typical causes exist.
DiagnosticActive	BIT	Indicates if any diagnostics are active or if the prognostics threshold is reached.	• 0 = No diagnostics active • 1 = One or more diagnostics are active or the prognostics threshold is reached
DiagnosticSequenceCount	SINT	Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected. Set to zero by product reset or power cycle. Wraps from 255 (-1) to 1 skipping zero.	-127…128 The value of 0 is skipped except during module power-up.
EventStatusx.CIPSyncTimeout	BIT	Indicates that the module was once synced with a 1588 master, but is not now due to a timeout.	• 0 = A valid time master has not timed out. • 1 = A valid time master was detected on the backplane, but the time master has timed out. The module is using its local clock and can be drifting away from the last known time master.
EventStatusx.CIPSyncValid	BIT	Indicates whether the module is synced with a 1588 master.	• 0 = CIP Sync is not available • 1 = CIP Sync is available
EventStatusx.EventDropped	BIT	Indicates when an event has been discarded because events are occurring faster than they are being acknowledged.	• 0 = An event status has not been dropped • 1 = An event status has been dropped
EventStatusx.EventNumber	DINT	Running count of events, which increments by one each new time event. The originator sets the Event Number Ack to the Event Number to acknowledge receipt of the event. When the EventNumber reaches it maximum value and rolls over it is to roll over to 1, not 0.	All values.
EventStatusx.EventReset	BIT	When EO.Event[<n>].ResetEvent transitions from 0 to 1, I.EventStatus[<n>].EventReset transitions to 1 to indicate that the reset was received and completed. It stays 1 until EO.Event[<n>].ResetEvent transition to zero.	• 0 = Do not reset • 1 = Reset
EventStatusx.EventsPending	SINT	The number of events currently queued in the modules. A value greater than zero indicates that the controller is not currently keeping up with the rate of events.	All positive values.
Ptxx.Chatter	BIT	1 = the Shows that the input is chattering per the ChatterTime and ChatterCount settings. 0 = Normal	• 0 = Normal • 1 = Input is chattering
Ptxx.CIPSyncTimeout	BIT	Indicates that the module was once synced with a 1588 master, but is not now due to a timeout.	• 0 = A valid time master has not timed out. • 1 = A valid time master was detected on the backplane, but the time master has timed out. The module is using its local clock and can be drifting away from the last known time master.
Ptxx.CIPSyncValid	BIT	Indicates whether the module is synced with a 1588 master.	• 0 = CIP Sync is not available • 1 = CIP Sync is available
Ptxx.Data	BIT	Indicates the current digital input value.	• 0 = On • 1 = Off

Table 28 - 5069-IB6F-3W Module Input Tags

Tag Name	Size	Definition	Valid Values
Ptxx.Fault	BIT	Indicates that channel data is inaccurate and **cannot be trusted** for use in the application. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good • 1 = Bad, causing fault The typical causes of uncertain data are the following: – Wire Off condition – Underrange/Overrange condition – Short Circuit condition We recommend that you first troubleshoot the module to see if the typical causes exist.
Ptxx.TimestampOffOn	LINT	64 bit Timestamp corresponding to when a change of state Off to On was recorded at the input.	All values.
Ptxx.TimestampOffOnNumber	INT	64 bit Timestamp corresponding to when a change of state Off to On was recorded at the input.	All values.
Ptxx.TimestampOnOff	INT	64 bit Timestamp corresponding to when a change of state On to Off was recorded at the input.	All values.
Ptxx.TimestampOnOffNumber	INT	64 bit Timestamp corresponding to when a change of state On to Off was recorded at the input.	All values.
Ptxx.TimestampOverflowOffOn	BIT	Indicates an Off to On time stamp was lost in a discrete product. If TimestampLatchEn is set then a new time stamp was not recorded because one is already latched. If TimestampLatchEn is clear a timestamp was overwritten.	0 or 1
Ptxx.TimestampOverflowOnOff	BIT	Indicates an On to Off time stamp was lost in a discrete product. If TimestampLatchEn is set then a new time stamp was not recorded because one is already latched. If TimestampLatchEn is clear a timestamp was overwritten.	0 or 1
Ptxx.Uncertain	BIT	Indicates that the channel data can be inaccurate but the **degree of inaccuracy is not known**. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good data • 1 = Uncertain data The typical causes of uncertain data are the following: – Data signal slightly outside the channel operating range – Invalid sensor offset value – The last point data sample failed CRC while the most recent data sample was valid and used We recommend that you first troubleshoot the module to see if the typical causes exist.
RunMode	BIT	Channel's operating state	• 0 = Idle • 1 = Run Mode
Uncertain	BIT	Indicates if the module is operating outside is designed operating range of if data is under manual or override control.	• 0 = Good • 1 = Uncertain

Output Tags

Table 29 describes the 5069-IB6F-3W module output tags.

Table 29 - 5069-IB6F-3W Module Output Tags

Tag Name	Size	Definition	Valid Values
Counterxx.Preset	DINT	If RolloverAtPreset is set, the counter counts to the Preset value and then rolls over to zero. If RolloverAtPreset is not set, the counter sets the Done bit and continues counting up to Max DINT. If C:RolloverAtPreset = 1, then if I:Count ≥ O:Preset, I:Count=0. I:Done bit always = 0. Set I:Rollover bit when I:Count transitions from O:Preset – 1 to 0. If C:RolloverAtPreset = 0, then if I:Count ≥ O:Preset, I:Done = 1, else I:Done = 0 Set I:Rollover bit when I:Count transitions from 2,147,483,647 to 0.	0…2,147,483,647
Counterxx.Reset	BIT	When this bit transitions from 0 to 1, I:Count, and I:Rollover are set to zero.	• 0 = Do not reset • 1 = Reset
Counterxx.RolloverAck	BIT	Clears the Rollunder bit in the input tag when it transitions from 0 to 1.	0 or 1
Ptxx.ResetTimestamps	BIT	Erases all recorded timestamps for the input channel when it transitions from 0 to 1.	• 0 = Timestamps are not erased • 1 = Timestamps are erased
Ptxx.TimestampOffOnNumberAck	INT	An Off to On timestamp identifier that is written by the controller to indicate that the identified timestamp has been seen and acted on. When Latching is enabled and the Timestamp Number that is received from the controller matches the most recent timestamp that is produced, the module is then allowed to produce a new timestamp.	All values.
Ptxx.TimestampOnOffNumberAck	INT	An On to Off timestamp identifier that is written by the controller to indicate that the identified timestamp has been seen and acted on. When Latching is enabled and the Timestamp Number that is received from the controller matches the most recent timestamp that is produced, the module is then allowed to produce a new timestamp.	All values.

5069-OB16 Module Tags

This section describes the tags that are associated with the 5069-OB16 module.

Configuration Tags

Table 30 describes the 5069-OB16 module configuration tags.

Table 30 - 5069-OB16 Module Configuration Tags

Tag Name	Size	Definition	Valid Values
Ptxx.FaultFinalState	BIT	If FaultValueStateDuration is nonzero determines the final Output state after the configured FalueValueStateDuration time out occurs.	0 or 1
Ptxx.FaultMode	BIT	Selects the behavior the output channel takes if a communication fault occurs. FaultValue defines the value to go to when set to user-defined value.	• 0 = Hold last state • 1 = Go to a user-defined value
Ptxx.FaultValue	BIT	Defines the value that the discrete output should assume if a communication fault occurs when FaultMode = 0.	• 0 = Off • 1 = On
Ptxx.FaultValueStateDuration	SINT	This value determines the length of time the Fault Mode state is held before the FaultFinalState being applied.	• 0 = Hold forever (default). • 1, 2, 5, or 10 seconds
Ptxx.NoLoadEn	BIT	Enables no load detection for output channels.	• 0 = Disable • 1 = Enable
Ptxx.ProgMode	BIT	Selects the behavior the output channel should take when transitioned into Program mode. ProgValue defines the value to go to when set to user-defined value.	• 0 = Hold last state • 1 = Go to a user-defined value
Ptxx.ProgramToFaultEn	BIT	Determines if an output should transition to the Fault Mode if the connection faults while in Program Mode.	• 0 = Stay in Program Mode • 1 = Go to Fault mode
Ptxx.ProgValue	BIT	Defines the value that the output should take when the connection transitions to Program mode if the ProgMode bit is set to "User-Defined Value".	• 0 = The output state is Off during Program mode. • 1 = The output state is On during Program mode.

Input Tags

Table 31 describes the 5069-OB16 module input tags.

Table 31 - 5069-OB16 Module Input Tags

Tag Name	Size	Definition	Valid Values
ConnectionFaulted	BIT	Indicates if a connection is running. The module sets this tag to 0 when connected. If the module is not connected, it changes the tag to 1.	• 0 = Connection running • 1 = Connection not running
DiagnosticActive	BIT	Indicates if any diagnostics are active or if the prognostics threshold is reached.	• 0 = No diagnostics active • 1 = One or more diagnostics are active or the prognostics threshold is reached
DiagnosticSequenceCount	SINT	Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected. Set to zero by product reset or power cycle. Wraps from 255 (-1) to 1 skipping zero.	-128…127 The value of 0 is skipped except during module power-up.

Table 31 - 5069-OB16 Module Input Tags

Tag Name	Size	Definition	Valid Values
Ptxx.Data	BIT	Indicates the current digital input value.	• 0 = On • 1 = Off
Ptxx.Fault	BIT	Indicates that channel data is inaccurate and **cannot be trusted** for use in the application. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good • 1 = Bad, causing fault The typical causes of uncertain data are the following: – No Load condition – Underrange/Overrange condition – Short Circuit condition We recommend that you first troubleshoot the module to see if the typical causes exist.
Ptxx.NoLoad	BIT	Indicates that the signal wire has been disconnected from one of its terminals or the RTB has been removed. Used with Output channels.	• 0 = No fault • 1 = Fault
Ptxx.ShortCircuit	BIT	Indicates an output short circuit or overcurrent.	• 0 = No short circuit • 1 = Short circuit or overcurrent
Ptxx.Uncertain	BIT	Indicates that the channel data can be inaccurate but the **degree of inaccuracy is not known**. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good data • 1 = Uncertain data The typical causes of uncertain data are the following: – Data signal slightly outside the channel operating range – Invalid sensor offset value – The last point data sample failed CRC while the most recent data sample was valid and used We recommend that you first troubleshoot the module to see if the typical causes exist.
RunMode	BIT	Channel's operating state	• 0 = Idle • 1 = Run Mode
Uncertain	BIT	Indicates if the module is operating outside is designed operating range of if data is under manual or override control.	• 0 = Good • 1 = Uncertain

Output Tags

Table 32 describes the 5069-OB16 module output tags.

Table 32 - 5069-OB16 Module Output Tags

Tag Name	Size	Definition	Valid Values
Ptxx.Data	BIT	Indicates the current digital input value.	• 0 = On • 1 = Off

5069-OB16F Module Tags

This section describes the tags that are associated with the 5069-OB16F modules.

Configuration Tags

Table 33 describes the 5069-OB16F module configuration tags.

Table 33 - 5069-OB16F Configuration Tags

Tag Name	Size	Definition	Valid Values
Ptxx.FaultFinalState	BIT	If FaultValueStateDuration is nonzero determines the final Output state after the configured FalueValueStateDuration time out occurs.	0 or 1
Ptxx.FaultMode	BIT	Selects the behavior the output channel should take if a communication fault occurs. FaultValue defines the value to go to when set to user-defined value.	• 0 = Hold last state • 1 = Go to a user-defined value
Ptxx.FaultValue	BIT	Defines the value that the discrete output should assume if a communication fault occurs when FaultMode = 0.	• 0 = Off • 1 = On
Ptxx.FaultValueStateDuration	SINT	This value determines the length of time the Fault Mode state is held before the FaultFinalState being applied.	• 0 = Hold forever (default). • 1, 2, 5, or 10 seconds
Ptxx.NoLoadEn	BIT	Enables no load detection for output channels.	• 0 = Disabled • 1 = Enabled
Ptxx.ProgMode	BIT	Selects the behavior the output channel should take when transitioned into Program mode. ProgValue defines the value to go to when set to user-defined value.	• 0 = Hold last state • 1 = Go to a user-defined value
Ptxx.ProgramToFaultEn	BIT	Determines if an output should transition to the Fault Mode if the connection faults while in Program mode.	• 0 = Stay in Program mode • 1 = Go to Fault mode
Ptxx.ProgValue	BIT	Defines the value that the output should take when the connection transitions to Program mode if the ProgMode bit is set to "User-Defined Value".	• 0 = The output state is Off during Program mode. • 1 = The output state is On during Program mode.

Input Tags

Table 34 describes the 5069-OB16F module input tags.

Table 34 - 5069-OB16F Module Input Tags

Tag Name	Size	Definition	Valid Values
CIPSyncTimeout	BIT	Indicates that the module was once synced with a 1588 master, but is not now due to a timeout.	• 0 = A valid time master has not timed out. • 1 = A valid time master was detected on the backplane, but the time master has timed out. The module is using its local clock and can be drifting away from the last known time master.
CIPSyncValid	BIT	Indicates whether the module is synced with a 1588 master.	• 0 = CIP Sync is not available • 1 = CIP Sync is available
ConnectionFaulted	BIT	Indicates if a connection is running. The module sets this tag to 0 when connected. If the module is not connected, it changes the tag to 1.	• 0 = Connection running • 1 = Connection not running
DiagnosticActivex	BIT	Indicates if any diagnostics are active or if the prognostics threshold is reached.	• 0 = No diagnostics active • 1 = One or more diagnostics are active or the prognostics threshold is reached

Table 34 - 5069-OB16F Module Input Tags

Tag Name	Size	Definition	Valid Values
DiagnosticSequenceCount	SINT	Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected. Set to zero by product reset or power cycle. Wraps from 255 (-1) to 1 skipping zero.	-128…127 The value of 0 is skipped except during module power-up.
LateScheduleCount	INT	Count of schedules, which arrive late. i.e. arrival time is after scheduled time. Counter rolls over every 65535 late updates. Output should still be driven to new state if this is the most recent schedule for that point. Useful in indicating that network delays/losses are causing scheduling issues.	All values.
LostScheduleCount	INT	Increments whenever the schedule sequence number in the output tag skips a value, which may indicate a lost schedule. Counter rolls over every 65535 lost updates.	All values.
Ptxx.Data	BIT	Current digital input value.	• 0 = On • 1 = Off
Ptxx.Fault	BIT	Indicates that channel data is inaccurate and **cannot be trusted** for use in the application. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good • 1 = Bad, causing fault The typical causes of uncertain data are the following: – No Load condition – Underrange/Overrange condition – Short Circuit condition We recommend that you first troubleshoot the module to see if the typical causes exist.
Ptxx.NoLoad	BIT	Indicates that the signal wire has been disconnected from one of its terminals or the RTB has been removed. Used with Output channels.	• 0 = No fault • 1 = Fault
Ptxx.ShortCircuit	BIT	Indicates an output short circuit or overcurrent.	• 0 = No short circuit • 1 = Short circuit or overcurrent
Ptxx.Uncertain	BIT	Indicates that the channel data can be inaccurate but the **degree of inaccuracy is not known**. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good data • 1 = Uncertain data The typical causes of uncertain data are the following: – Data signal slightly outside the channel operating range – Invalid sensor offset value – The last point data sample failed CRC while the most recent data sample was valid and used We recommend that you first troubleshoot the module to see if the typical causes exist.
RunMode	BIT	Channel's operating state	• 0 = Idle • 1 = Run Mode
Schedulex	SINT	Indicates which schedule to load from 32 available schedules.	• 1…32 = Valid schedule • 0, 129…255 = No schedule

Table 34 - 5069-OB16F Module Input Tags

Tag Name	Size	Definition	Valid Values
Schedulex.ScheduleNumber	SINT	Echo of ScheduleNumber from the output image.	• 0…3
Schedulex.State	SINT	Current state of the schedule at index x.	• 0 = Inactive • 1 = Active – schedule is next to be applied to any of the outputs. • 2 = Current – schedule is not the next to be applied one of the outputs. • 3 = Expired – schedule has been applied. • 4 = Discarded – scheduled but mask was off, or the requested schedule was late (received after its scheduled application time) and a more recent schedule has already been applied to that output point. • 5 = Late – received schedule after the time it is to be applied.
Uncertain	BIT	Indicates if the module is operating outside is designed operating range of if data is under manual or override control.	• 0 = Good • 1 = Uncertain

Output Tags

Table 35 describes the 5069-OB16F module output tags.

Table 35 - 5069-OB16F Module Output Tags

Tag Name	Size	Definition	Valid Values
Ptxx.Data	BIT	Current digital input value.	• 0 = On • 1 = Off
Ptxx.ScheduleEn	BIT	Specifies the use of normal output data or scheduled data.	• 0 = Normal output data • 1 = Scheduled data
Schedulex	SINT	Indicates which schedule to load from 32 available schedules.	• 1…32 = Valid schedule • 0, 129…255 = No schedule
Schedulex.Data	BIT	Output data to be applied at time that is specified in schedule.	0 or 1
Schedulex.ID	SINT	There are 32 schedules available (for Neo R1 products). Indicates which schedule to load.	• 1…32 = Valid schedule • 0 or 129…255 = No schedule
Schedulex.OutputPointSelect	SINT	Selects the output point that this schedule applies to. 0xFF means no output point selected.	0…15
Schedulex.SequenceNumber	SINT	Indicates that the schedule information is valid and that this schedule should be processed.	All values.
Schedulex.TimeOffset	DINT	Offset from schedule base time. Used for scheduled output consumed tags. Base/Offset scheme that is used to fit enough schedules in the assembly.	All values.
TimeBase	LINT	Indicates the TimeBase for all schedule times in a scheduled output consumed assembly or channel. The TimeBase + The Schedule[n].TimeOffset determines the time for the schedule. Base/Offset scheme that is used to fit enough schedules into the assembly.	Any positive value.

5069-OW4I, 5069-OX4I Module Tags

This section describes the tags that are associated with the 5069-OW4I and 5069-OX4I modules. The tags are the same for each module.

Configuration Tags

Table 36 describes the 5069-OW4I and 5069-OX4I module configuration tags.

Table 36 - Relay Output High Current Module Configuration Tags

Tag Name	Size	Definition	Valid Values
Ptxx.FaultFinalState	BIT	If FaultValueStateDuration is nonzero determines the final Output state after the configured FalueValueStateDuration time out occurs.	0 or 1
Ptxx.FaultMode	BIT	Selects the behavior the output channel should take if a communication fault occurs. FaultValue defines the value to go to when set to user-defined value.	• 0 = Hold last state • 1 = Go to a user-defined value
Ptxx.FaultValue	BIT	Defines the value that the discrete output should assume if a communication fault occurs when FaultMode = 0.	• 0 = Off • 1 = On
Ptxx.FaultValueStateDuration	SINT	This value determines the length of time the Fault Mode state is held before the FaultFinalState being applied.	• 0 = Hold forever (default). • 1, 2, 5, or 10 seconds
Ptxx.ProgMode	BIT	Selects the behavior the output channel should take when transitioned into Program mode. ProgValue defines the value to go to when set to user-defined value.	• 0 = Hold last state • 1 = Go to a user-defined value
Ptxx.ProgramToFaultEn	BIT	Determines if an output should transition to the Fault Mode if the connection faults while in Program mode.	• 0 = Stay in Program mode • 1 = Go to Fault mode
Ptxx.ProgValue	BIT	Defines the value that the output should take when the connection transitions to Program mode if the ProgMode bit is set to "User-Defined Value".	• 0 = The output state is Off during Program mode. • 1 = The output state is On during Program mode.

Input Tags

Table 37 describes the 5069-OW4I and 5069-OX4I module input tags.

Table 37 - Relay Output High Current Module Input Tags

Tag Name	Size	Definition	Valid Values
ConnectionFaulted	BIT	Indicates if a connection is running. The module sets this tag to 0 when connected. If the module is not connected, it changes the tag to 1.	• 0 = Connection running • 1 = Connection not running
DiagnosticActive	BIT	Indicates if any diagnostics are active or if the prognostics threshold is reached.	• 0 = No diagnostics active • 1 = One or more diagnostics are active or the prognostics threshold is reached
DiagnosticSequenceCount	SINT	Increments for each time a distinct diagnostic condition is detected, and when a distinct diagnostic condition transitions from detected to not detected. Set to zero by product reset or power cycle. Wraps from 255 (-1) to 1 skipping zero.	-128…127 The value of 0 is skipped except during module power-up.
Ptxx.Data	BIT	Indicates the current digital input value.	• 0 = On • 1 = Off
Ptxx.Fault	BIT	Indicates that channel data is inaccurate and **cannot be trusted** for use in the application. If the tag is set to 1, you must troubleshoot the module to correct the cause of the inaccuracy. **IMPORTANT**: Once the condition that causes the tag to change to 1 is removed, the tag automatically resets to 0.	• 0 = Good • 1 = Bad, causing fault
Ptxx.Uncertain	BIT	Indicates that the channel data can be inaccurate but the **degree of inaccuracy is not known**. If the tag is set to 1, we recommend that you troubleshoot the module to discover what degree of inaccuracy exists.	• 0 = Good data • 1 = Uncertain data
RunMode	BIT	Channel's operating state	• 0 = Idle • 1 = Run Mode

Output Tags

Table 38 describes the 5069-OW4I and 5069-OX4I module outputs tags.

Table 38 - Relay Output High Current Module Output Tags

Tag Name	Size	Definition	Valid Values
Ptxx.Data	BIT	Indicates the current digital input value.	• 0 = On • 1 = Off

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